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ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 389

DATE: Wednesday, June 24, 1992

BEFORE:

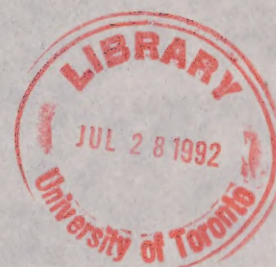
A. KOVEN Chairman

E. MARTEL Member

FOR HEARING UPDATES CALL (COLLECT CALLS ACCEPTED) (416)963-1249

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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER of a Notice by The Honourable
Jim Bradley, Minister of the Environment,
requiring the Environmental Assessment
Board to hold a hearing with respect to a
Class Environmental Assessment (No.
NR-AA-30) of an undertaking by the Ministry
of Natural Resources for the activity of
Timber Management on Crown Lands in
Ontario.

Hearing held at the Civic Square, Council
Chambers, Sudbury, Ontario on Wednesday,
June 24, 1992, commencing at 8:30 a.m.

VOLUME 389

BEFORE:

MRS. ANNE KOVEN
MR. ELIE MARTEL

Chairman
Member



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MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION

I N D E X O F P R O C E E D I N G S

<u>Witness:</u>	<u>Page No.</u>
<u>J. OSBORN,</u> <u>KEN ABRAHAM,</u> <u>FRANK KENNEDY; Resumed.</u> <u>PETER W.C. UHLIG,</u> <u>WILLIAM R. WATT; Affirmed.</u>	66976
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I N D E X O F E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
2272	Panel 3 Statement of Evidence.	66968
2273A	Complete set of interrogatories filed by the Ministry of the Environment.	66968
2273B	Complete set of interrogatories filed by Forests For Tomorrow.	66969
2274	Document entitled: An Investigation into the Effects of Timber Management on Wildlife, prepared by Grieg, et al, dated May 17th, 1991.	66969
2275	66-page ESSA report entitled: Wildlife Habitat Management Strategies, prepared by Wedeles et al, dated March 15th, 1991.	66970
2276	Code of Practice for Timber Management Operations in Riparian Areas.	66972
2277	MNR Policy No. FR 16-01-01 for using the Code of Practice for Timber Management Operations in Riparian Areas, dated January 22nd, 1990.	66972
2278	Video produced by the Ministry of Natural Resources dated 1991, entitled: Cutting Near the Edge, Protecting Shoreline Areas.	66973
2279	Seven-page Pamphlet produced by the Information Resources Division of the Ministry of Natural Resources entitled: Integrated Natural Resources Inventory System.	66974

I N D E X O F E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
2280	Two-page curriculum vitae of Mr. W.R. Watt.	66976
2281	Five-page curriculum vitae of Mr. P.W.C. Uhlig.	66976
2282	5-page Overhead entitled: Implementation Manuals of Provincial Technical Committee, Review and Revision and Revision of Silvicultural Guides.	66995
2283	34-page Overhead entitled: Information Collection and Management.	67004
2284	23-page overhead entitled: Information Collection and Management Forest Ecosystem Classification Ecological Land Classification.	67047
2285	17-page Overhead entitled: Scientific Research and Development.	67085
2286	Overhead entitled: Scientific Research and Technical Development.	67123

1 ---Upon commencing at 8:33 a.m.

2 MS. BLASTORAH: Good morning, Madam Chair
3 and Mr. Martel, we're ready to commence Panel 3 of our
4 reply evidence, and I'd like to begin by marking some
5 exhibits, if I may, please.

6 The first exhibit to be marked this
7 morning is a copy of the reply statement of evidence
8 No. 3. I believe we left off at Exhibit 2271
9 yesterday, so that would be...

10 ---Discussion off the record.

11 MADAM CHAIR: That's right, Ms.
12 Blastorah. Mr. Lindgren had at one point asked for
13 another exhibit number, but it was never used for the
14 exhibit, so we're now on 2272.

15 MS. BLASTORAH: I thought we had reserved
16 Exhibit 2270 for the response.

17 MADAM CHAIR: After that. After that Mr.
18 Lindgren - is he here? - had requested, we had talked
19 about using Exhibit 2272 for something, but then we
20 dropped that.

21 MR. LINDGREN: Yes, Madam Chair, we had
22 anticipated filing the Panel 3 interrogatories, but
23 then we deferred that.

24 MS. BLASTORAH: Okay. So this one will
25 be 2272, then. And that's the Panel 3 Statement of

1 Evidence. Unfortunately, the record copy didn't get
2 put in my box of materials to be marked, so I'll
3 provide that to Mr. Pascoe this afternoon.

4 ---EXHIBIT NO. 2272: Panel 3 Statement of Evidence.

5 MS. BLASTORAH: And the next document
6 would be a copy of the interrogatories in relation to
7 Panel 3 and those are the complete set of
8 interrogatories, I believe, filed by the Ministry of
9 the Environment and Forests For Tomorrow.

10 Perhaps we could, I have them stapled
11 separately at this time, and perhaps we could mark
12 those as Exhibit 2273A and B. And I did bring copies
13 for the Board this morning to simplify matters.

14 Shall we mark the Ministry of the
15 Environment interrogatories as 2273A and the Forests
16 For Tomorrow interrogatories as 2273B? And the number
17 of pages in those packages; in A, 2273A, there are
18 eighteen pages copied double-sided.

19 ---Discussion off the record.

20 MS. BLASTORAH: Oh, I beg your pardon, I
21 may be wrong on that. I'm sorry. There are eight
22 pages copied double-sided in Exhibit 2273A, and
23 eighteen pages in Exhibit 2273B.

24 ---EXHIBIT NO. 2273A: Complete set of interrogatories
25 filed by the Ministry of the
Environment.

---EXHIBIT NO. 2273B: Complete set of interrogatories
filed by Forests For Tomorrow.

MS. BLASTORAH: And the next document to be marked would be a document entitled: An Investigation into the Effects of Timber Management on Wildlife. And that is prepared by Grieg, G-r-e-i-g, et al, dated May 17th, 1991. And that document is 71 pages plus appendices, two appendices, and I believe that would be exhibit 2274.

---EXHIBIT NO. 2274: Document entitled: An
Investigation into the Effects of
Timber Management on Wildlife,
prepared by Grieg, et al, dated
May 17th, 1991.

MS. BLASTORAH: This document was referenced in the front of the Panel 3 witness statement and the parties were advised that if they required any of these documents, they would be provided on request. I think the only party we received a request for this document from was Forests For Tomorrow and it was provided.

I haven't brought additional copies for the parties today, if someone -- and I believe it was previously distributed to the parties as well. If anyone requires an additional copy, we would attempt to have one provided. It is rather large, however; and since they didn't request it, we haven't done that. I

1 do have copies for the Board and for the record.

2 ---Discussion off the record.

3 MS. BLASTORAH: Just for the sake of
4 clarity, Exhibit 2274, I believe, previous graphs of
5 that document which was prepared by ESSA were marked, I
6 think, during the evidence of Forests For Tomorrow
7 Panel 9. This is the final report and it's what the
8 Board heard referred to -- has heard referred to at
9 various places in the evidence as the "report of the
10 other wildlife project."

11 ---Discussion off the record.

12 MS. BLASTORAH: I'm advised by Mr. Pascoe
13 that that draft of that document is marked as Exhibit
14 1713C, it was draft 1, and I believe 1714 was draft No.
15 2 of that report.

16 The next document to be marked is another
17 ESSA report entitled: Wildlife Habitat Management
18 Strategies and the authors are Wedeles, W-e-d-e-l-e-s
19 et al. The document is dated March 15th, 1991, and is
20 66 pages in length. And I believe that would be
21 Exhibit 2275.

22 ---EXHIBIT NO. 2275: 66-page ESSA report entitled:
23 Wildlife Habitat Management
24 Strategies, prepared by Wedeles
et al, dated March 15th, 1991.

25 MS. BLASTORAH: Again, this was noted in

1 front of the Panel 3 witness statement and is available
2 upon request. And I believe a copy was provided to
3 Forests For Tomorrow at their request. I believe I may
4 have one extra copy of that, if anybody wishes it
5 today.

6 ---Discussion off the record.

7 MS. BLASTORAH: The next document to be
8 marked would be a booklet entitled: Code of Practice
9 for Timber Management Operations in Riparian Areas.

10 This is a publication of the Ministry of
11 Natural Resources dated 1991. The document is
12 published in both English and French and is ten pages
13 in length in each language, so I suppose the full
14 document is twenty pages.

15 You may recall, Madam Chair, a copy of
16 the Code of Practice was previously marked in evidence.
17 This is somewhat different. The text I don't think is
18 different but they have given an illustrative copy, so
19 we felt it was appropriate to mark it.

20 Again, I have copies for the Board and
21 the record, and I have one or two extra copies. I
22 believe it was already provided to Forests For Tomorrow
23 and I don't believe the Ministry of the Environment
24 asked for it, but we do have copy if they wish one.

25 MADAM CHAIR: Ms. Blastorah, what was the

1 number of this material that we have as an exhibit
2 already?

3 MS. BLASTORAH: I'm afraid I haven't made
4 a note of that, but I will obtain that number for you.

5 And that would be Exhibit 2276.

6 ---EXHIBIT NO. 2276: Code of Practice for Timber
7 Management Operations in Riparian
Areas.

8 MS. BLASTORAH: And the related document,
9 which I don't believe has been filed previously, is the
10 Policy for using the Code of Practice for Timber
11 Management Operations in Riparian Areas. That's MNR
12 Policy No. FR 16-01-01, dated January 22nd, 1990. And
13 the policy is two pages in length. We have reproduced
14 it double-sided so it is a single page. And that would
15 be Exhibit 2277, I believe? Am I correct on that,
16 Madam Chair?

17 ---EXHIBIT NO. 2277: MNR Policy No. FR 16-01-01 for
18 using the Code of Practice for
19 Timber Management Operations in
Riparian Areas, dated January
22nd, 1990.

20 MS. BLASTORAH: I believe, again, I do
21 have one extra copy of that if anyone wants it. And it
22 could easily be reproduced, if someone requires a copy.

23 And another related item is a video which
24 has previously been provided to Mr. Pascoe. It is a
25 video produced by the Ministry of Natural Resources

1 dated, I guess, 1991. It is titled: Cutting Near the
2 Edge, Protecting Shoreline Areas. And Mr. Pascoe is
3 providing it to you now.

4 That video is 21 minutes -- 21.2 minutes,
5 very precise, in duration, and as is noted in the front
6 of the Panel 3 statement of evidence, that video was
7 made available through the Board in their reading room.
8 And for the Board's information, it is a video in
9 relation to the application of the Code of Practice for
10 Timber Management Activities in Riparian Areas.

11 ---EXHIBIT NO. 2278: Video produced by the Ministry of
12 Natural Resources dated 1991,
13 entitled: Cutting Near the Edge,
 Protecting Shoreline Areas.

14 ---Discussion off the record.

15 MS. BLASTORAH: And the next document
16 is --

17 MADAM CHAIR: Excuse me, Ms. Blastorah,
18 the video is Exhibit 2278?

19 MS. BLASTORAH: Yes, I'm sorry. Yes, it
20 is.

21 The next document is a pamphlet titled:
22 Integrated Natural Resources Inventory System, eight
23 pages in length.

24 Dr. Osborn, am I correct that this
25 pamphlet was produced by the Information Resources

1 Division of the Ministry of Natural Resources?

2 DR. OSBORN: Yes.

3 MS. BLASTORAH: And could you advise the
4 Board what the purpose of this pamphlet was, just in a
5 few words?

6 DR. OSBORN: It was the lay description
7 to describe to a variety of audiences what exactly
8 INRIS was.

9 MS. BLASTORAH: And that document is
10 dated September 16th, 1991.

11 Thank you, Dr. Osborn.

12 I believe we're up to Exhibit 2279, Madam
13 Chair?

14 ---EXHIBIT NO. 2279: Seven-page Pamphlet produced by
15 the Information Resources
16 Division of the Ministry of
17 Natural Resources entitled:
Integrated Natural Resources
Inventory System.

18 MS. BLASTORAH: A copy of that has been
19 provided to Forests For Tomorrow, again, at their
20 request. I'm afraid I don't have extra copies of that
21 here this morning but it could be made available.
22 Again, it was referenced in the front of the Panel 3
23 statement of evidence and is available upon request.

24 And I think I neglected to mention that
25 that pamphlet was seven pages in length.

1 And the last two items to be marked, I
2 believe, this morning, Madam Chair, are the curriculum
3 vitae of the two witnesses who have not previously
4 appeared before the board.

5 The first would be the curriculum vitae
6 of Robert Watt, who you see on the left hand side of
7 the panel of witnesses there. And I'd ask that his
8 curriculum vitae be marked as Exhibit 2279?

9 MADAM CHAIR: 2280.

10 MS. BLASTORAH: 2280, I beg your pardon.

11 And that is two pages in length. Again,
12 this was previously provided to the parties by letter
13 some time ago. I have copies of them here for the
14 Board.

15 MADAM CHAIR: Ms. Blastorah, we have the
16 CV's of Mr. Watt and Mr. Uhlig and Dr. Wagner in one
17 package.

18 MS. BLASTORAH: Okay. I had not intended
19 to mark Dr. Wagner's this morning since he's not here.
20 I was going to mark them separately. But I have
21 separate copies, or however you wish to handle that for
22 the record, then. You can mark them A and B and add
23 Dr. Wagner's as C later, if you wish.

24 Would you prefer to mark it as a single
25 package? I had prepared it this morning. I thought it

1 was -- so Mr. Watt's curriculum vitae would be 2280 and
2 the next, and I believe last document, to be marked
3 this morning is the curriculum vitae of Mr. Peter
4 Uhlig, who you also see on the witness panel this
5 morning, sitting next to Mr. Kennedy, and that document
6 is five pages in length.

7 I do have some extra copies of those if
8 someone didn't bring their this morning. And I believe
9 that would be Exhibit 2281.

10 ---EXHIBIT NO. 2280: Two-page curriculum vitae of Mr.
11 W.R. Watt.

12 ---EXHIBIT NO. 2281: Five-page curriculum vitae of Mr.
13 P.W.C. Uhlig.

14 MS. BLASTORAH: And I believe the next
15 order of business would be to affirm Mr. Watt and Mr.
16 Uhlig. The other witnesses, as you're aware, have
17 appeared before the Board and are previously sworn.

18 MADAM CHAIR: Good morning, gentlemen.

19 J. OSBORN,
20 KEN ABRAHAM,
FRANK KENNEDY; Resumed.
PETER W.C. UHLIG,
WILLIAM R. WATT; Affirmed.

21 MS. BLASTORAH: And lastly, Madam Chair,
22 I would ask your indulgence for a few moments to
23 qualify the two new witness and I think it would be
24 appropriate to ask Dr. Osborn to update briefly what
25 he's been doing since he last appeared before the

1 Board.

2 We don't wish to change his
3 qualification, but he has had two new positions since
4 you last saw him at least in this forum.

5 MR. MARTEL: Nobody wants it.
6 (laughter).

7 MS. BLASTORAH: I think you hurt his
8 feelings, Mr. Martel.

9 MR. FREIDIN: Just add it to your work
10 experience, Dr. Osborn.

11 MS. BLASTORAH: And I would just like to
12 have him go through that very quickly.

13 DIRECT EXAMINATION BY MS. BLASTORAH/MR. FREIDIN:

14 Q. Dr. Osborn, in 1990 I believe you
15 changed your position with the Ministry of Natural
16 Resources and took on the position of manager, special
17 assignments for Forests Resources Branch. Could you
18 briefly describe for the Board what your
19 responsibilities in that position include?

20 DR. OSBORN: A. I was asked to look at
21 the information requirements for essentially all of the
22 forestry program at that time within the Ministry and
23 to think through and perhaps try and describe the array
24 of those requirements and the ways and means by which
25 they would be collected, synthesized and made

1 accessible.

2 So I was asked for that broad perspective
3 of both field and head office forestry requirements to
4 come up with some structure of how those data and
5 information could be best managed.

6 Q. And in 1991 you again changed
7 positions, Dr. Osborn, and became manager of the
8 natural resources information system, development,
9 information, technology and planning and development
10 branch with the Ministry of Natural Resources, and,
11 again, could you briefly indicate to the Board the
12 nature of your responsibilities in that position?

13 A. Almost in a nutshell I was asked then
14 to put into practice what I spent the last nine months
15 trying to describe for forestry, but with a somewhat
16 broader mandate, because I was asked to look after a
17 team of people involved in the systems, information
18 management systems behind the whole array of natural
19 resources, not just forest, and so expand all the way
20 from the water fisheries end right the way through
21 wetlands, right the way through into the terrestrial
22 wildlife and trees, end of the story.

23 So now I'm in a systems development part
24 of the Ministry, listening to what the user
25 requirements are and trying to translate those into

1 useful pieces of software.

2 MS. BLASTORAH: Thank you, Dr. Osborn.

3 I would just indicate for the record,
4 Madam Chair, that Dr. Osborn's previous qualification
5 was, he was qualified as an expert in forest
6 mensuration whose work includes FRI, MAD and yield
7 regulations, data collections, statistical methods and
8 management information systems, including standards,
9 data capability -- sorry, data compatibility and GIS;
10 and I don't think it's necessary to add to those
11 qualifications, we just wanted you to know the nature
12 of his experience since you last saw him.

13 I would turn, then, to Mr. Uhlig.

14 Q. And, Mr. Uhlig, I see from your
15 curriculum vitae that you have a Bachelor of Science
16 from the University of Guelph in quantitative forest --
17 or specialization, rather, in quantitative forest
18 ecology; is that correct?

19 MR. UHLIG: A. Yes, that's correct.

20 Q. And you then went on and pursued a
21 Master's degree with a specialization -- and that's a
22 Master of Science degree, I beg your pardon, with a
23 specialization in soil classification and survey.

24 A. Yes, that's also correct.

25 Q. And did that degree involve thesis

1 work?

2 A. Yes, there were theses at both
3 levels.

4 Q. And are either of those relevant to
5 the evidence you'll be giving to the Board?

6 A. The second one is perhaps more
7 closely related since it dealt with using the constant
8 soils data to development broad level classifications
9 in an area that had yet been unsurveyed. It was all
10 done in Hudson's Bay area.

11 Q. And I believe from your CV that your
12 course work, as part of your degrees, included training
13 in quantitative methods in forest ecology; is that
14 correct?

15 A. Yes.

16 Q. And plant ecology, plant taxonomy and
17 plant physiology and stress response?

18 A. That's true.

19 Q. And you also had course work in soil
20 classification and survey, soil chemistry, soil
21 physics?

22 A. Yes.

23 Q. And climatology, remote sensing and
24 methods in land inventory?

25 A. That's true.

1. Q. And upon graduation you joined --
2 upon graduation you joined the Ministry of Natural
3 Resources as a forest ecologist and forest soils
4 specialist?

5 A. Yes. That was a contract position
6 first out -- first out of the then forest research
7 organization and then later it was switched to the
8 mensuration branch.

9 Q. And prior to completion of your
10 education, I believe you had some employment during the
11 course of your university career that was relevant or
12 that is relevant to the evidence you wish to give the
13 Board.

14 Was there something you wish to highlight
15 in relation to that before we move on in your...?

16 A. There were a variety of either
17 contract positions, private industry or with the
18 university that dealt with different aspects of land
19 inventory, remote sensing; different contracts that
20 dealt with global interpretation of land types or using
21 remote sensing, particularly high attitude airborne
22 remote sensing sources for land type identification in
23 Southern Ontario; and a variety of smaller tasks,
24 relating to those.

25 Q. And going back, then, to your

1 position as forest ecologist for a soils specialist, I
2 may have missed it, but did your responsibilities in
3 that position involve you with the Ministry of Forest
4 Ecosystem Classification Development?

5 A. Yes, it did. The position was
6 actually to begin an -- what was then the northwestern
7 region of forest ecosystem classification. So that
8 position was focused on developing the proper analysis
9 to initiating data collection, providing the data
10 collection design and the first portion of that
11 program.

12 Q. And in 1988 you continued with the
13 Ministry of Natural Resources, I understand, but you
14 took on the position of forest ecologist with the
15 Ontario Forest Research Institute; is that correct?

16 A. Yes. That's a more recent, that's
17 since January, before -- we're being reorganized, as
18 you know. I now suit the Ontario Forest Institute,
19 prior to the -- this January, I was with the applied
20 science and technology section of forest policy branch.

21 The position and the tasks were the same,
22 but our affiliation has been changed just over the past
23 few months.

24 Q. And do you have additional
25 responsibilities in your current position?

1 A. There is a broader focus on the
2 program now. One of, one of more provincial
3 coordination of the many different programs we have
4 going in forest ecosystem classification or different
5 types of land inventories, such as soil surveys, as
6 well as collaborative efforts with other research
7 programs, such as the long report, recent programs,
8 part of the new program; I have had some involvement
9 with the old growth program that's under me right now,
10 forest fragmentation biodiversity.

11 So as well as the land inventory or
12 ecosystem classification programs which are my main
13 responsibility, there are also activities (inaudible)
14 ---Reporter appeals.

15 MR. UHLIG: Sorry. Just that there were,
16 in addition to the ecosystem classification activities
17 and land inventory, there also other program
18 responsibilities outside.
19 ---Discussion off the record.

20 MS. BLASTORAH: Q. And lastly, Mr.
21 Uhlig, I understand that your current responsibilities
22 include training; am I correct?

23 MR. UHLIG: A. That's true.

24 Q. And I see on page 50 of the Panel 3
25 statement of evidence that since 1988 over 500

1 individuals have been trained on the basic components
2 of the existing forest ecosystem classifications. Did
3 you have any involvement in that training?

4 A. Since 1988 I've been involved in
5 several, I couldn't give you the exact number, but
6 several of those courses either as just an instructor
7 for or for course curriculum or in actually developing
8 some of those courses and delivering, usually in
9 conjunction with the regional technology development
10 units.

11 Q. And I see you also have a number of
12 publications cited in your curriculum vitae; are there
13 any of those that you would like to highlight to the
14 Board as particularly relevant to the evidence you will
15 be giving to them today and tomorrow?

16 A. Perhaps most relevant is the
17 fourth -- sixth publication down, the one entitled: A
18 Catalogue of Land Resource Surveys in Ontario of Major
19 Use and Forest Management, which I believe was entered
20 as an exhibit earlier in hearings. I don't recall the
21 number, I'm sorry.

22 Since that time there are a number of
23 other publications related to the delivery of forest
24 ecosystem classification program, including McLean and
25 Uhlig, 1896, which is a methods training manual for

1 data collection and comprises a data collection
2 standard for the province. There's also another report
3 McLean and Uhlig, 1990, which is the first report of
4 the ecological data repository. This is a compilation
5 of all the ecological data we have collected in the
6 forest ecosystem classification into a relational
7 database and making that available to users; and most
8 recently the article by Sims and Uhlig, 1992, which was
9 recently public in the Forestry Chronicle, outlining
10 the current status of the material, like our forest
11 ecosystems or site classification program.

12 Q. And before we finish up, Mr. Uhlig,
13 is there anything you would like to add in relation to
14 your work experience or educational experience that's
15 relevant to your evidence before the Board today?

16 A. No, nothing in particular.

17 Q. Thank you.

18 MS. BLASTORAH: Based on that, Madam
19 Chair, I would ask that Mr. Uhlig be qualified as a
20 forest ecologist with particular expertise in the
21 development and application of ecological inventory
22 classification systems.

23 MADAM CHAIR: Are there any objections?

24 Mr. Uhlig, shall be so qualified.

25 MS. BLASTORAH: Thank you. And I think

1 it's worth noting that Mr. Uhlig is one of the -- is
2 perhaps unique in that he has pursued a fairly highly
3 specialized area throughout his, his educational and
4 work career.

5 Next I would like to turn to Mr. Watt.

6 Q. And, Mr. Watt, I understand that you
7 have a Bachelor of Science Forestry degree?

8 MR. WATT: A. Yes. Since 1983 from the
9 University in New Brunswick. It was a degree which - a
10 five year degree - which featured a specialization in
11 wildlife management as well, so that the academic
12 credentials or the academic qualifications on
13 completion of the program will allow me to be certified
14 as a professional wildlife biologist as well as a
15 forester.

16 Q. And I believe that you had thesis
17 work involved in that degree; is that correct?

18 A. Yes. I prepared a thesis on habitat
19 used by male woodcock, a small forest game bird, which
20 was later -- excerpts of which were later published in
21 the Wildlife Society bulletin.

22 Q. And am I correct that is the fourth
23 item referenced in your curriculum vitae under
24 Publications and Reports?

25 A. I don't have a copy here with me so

1 I'm afraid you'll have to read the title for me to
2 answer that question.

3 Q. I beg your pardon. It's entitled:
4 Male woodcock in Coniferous Forests, Implications for
5 Route Allocations in Survey.

6 A. Yes, that's the appropriate document.

7 Q. And after completion of your
8 undergraduate degree you continued at the University of
9 New Brunswick with some additional graduate courses; is
10 that correct?

11 A. Yes. I took additional graduate
12 courses primarily involving habitat management, habitat
13 planning, the modelling, some statistics courses and a
14 course in research methods.

15 Q. And I see from your CV that upon
16 completion of your work at the University of New
17 Brunswick, you entered a student internship in 1985
18 with the U.S. Department of Agriculture, Forest
19 Service.

20 Is that experience relevant to your
21 evidence before the Board?

22 A. Yes, it is. I spent three months
23 working with Dr. Jack Ward Thomas who I understand has
24 sent his material to the Board.

25 For that three months I participated in a

1 radio study on the habitat use of Gregory Ellis Morgan
2 (phoen) and was given the task of reviewing all of the
3 current research plans that that particular unit of the
4 U.S. Forest Service was engaged in to look at,
5 basically understand why they were doing research the
6 way they were doing it and to ensure that the
7 objectives of the research would be met by the
8 methodologies, et cetera.

9 Q. And I believe that upon completion of
10 that internship, you became a habitat analyst with the
11 New Brunswick Department of Natural Resources and
12 Energy, Fish and Wildlife Branch; is that correct?

13 A. Yes, it is.

14 Q. And could you briefly outline the
15 nature of your responsibilities in that position?

16 A. When I started with the Fish and
17 Wildlife Branch in New Brunswick, it was the second
18 year of their program developing of habitat supply
19 modelling, which Jeff Patch (phoen) was at the time
20 leading that program. He has also presented evidence
21 to the Board.

22 My responsibilities were focused on the
23 development of habitat relationships for terrestrial
24 invertebrates. It involved coordinating and conducting
25 literature reviews, synthesising that information and

1 preparing preliminary habitat relationships for root
2 within the habitat supply models.

3 I also initiated several fuel validation
4 or research projects to test those relationships.

5 Q. And before we leave New Brunswick, I
6 see that while you were at the faculty of forestry, you
7 were a research assistance. Is there anything that you
8 would like to highlight from that experience that's
9 relevant to the Board?

10 A. During that time, I was employed by
11 several professors, which is common for people that are
12 undergoing graduate education. One of them was to be a
13 lab instructor for Dr. Baskerville's course on forest
14 dynamics and management, which involved understanding
15 and certainly applying a lot of the concepts of
16 adaptive management wood supply and habitat supply.

17 I was also a research assistant in the
18 field for Dr. Capy (phoen) looking at the spruce bruce
19 and, again, woodcock habitat.

20 Q. And in 1989 I understand that you
21 moved to Ontario and joined the Ministry of Natural
22 Resources as a habitat specialist or program biologist;
23 is that correct?

24 A. Yes, that's correct.

25 Q. And would you highlight for the Board

1 the nature of your responsibilities in that position?

2 A. When I moved to Timmins with the
3 Ministry of Natural Resources, it was a new position
4 that hadn't been on the books before; a new program,
5 the mandate of which was to develop and pass along to
6 our clients - which was the forest industry and
7 practicing foresters and biologist in the districts -
8 new information, knowledge, technologies dealing with
9 wildlife habitat management.

10 Because it was brand new, we basically
11 started from scratch. We prepared a five-year plan of
12 action and began focusing on the development of habitat
13 supply modelling in northeastern Ontario.

14 Q. And I see on page 1 of your
15 curriculum vitae that you are -- you presently remained
16 in that position at the Northern Forest Development
17 Group.

18 Could you indicate to the Board what that
19 group is?

20 A. The Northern Forest Development Group
21 is the forest technology development unit of the old
22 northern region which is now the northeast region.

23 Q. And is it fair to say, Mr. Watt, that
24 your education and work experience have exposed you to
25 the concept of adaptive management and its application?

1 A. Yes, very much so. As I mentioned
2 earlier I was a teaching assistant under Dr.
3 Baskerville dealing with many of those issues and all
4 of the habitat supply modelling work that we developed
5 in New Brunswick and are in the process of developing
6 in the now northeast region are centred around the
7 concept of adaptive management.

8 MS. BLASTORAH: And based on that, Madam
9 Chair, I would ask that Mr. Watt be qualified as a
10 forester and wildlife biologist, with particular
11 expertise in habitat supply modelling and analysis and
12 in the concept of adaptive management.

13 MADAM CHAIR: Any objections?

14 In that case, Mr. Watt will be so
15 qualified.

16 MS. BLASTORAH: Thank you.

17 MR. FREIDIN: Madam Chair, we're going to
18 start off the evidence of the panel by Mr. Kennedy
19 providing a road map to the evidence, and when he's
20 finished that, I think we'll just keep going because he
21 will be the first witness to give evidence on this
22 panel.

23 MR. KENNEDY: Madam Chair, as in other
24 panels, we thought it would be appropriate to give you
25 a bit of an idea as to who in fact would be dealing

1 with what subject matter. And as such we can advise
2 you that MNR's Reply Panel 3 will be providing the
3 Board with updates and current status reports of many
4 of the terms and conditions that we have submitted to
5 the Board.

6 The evidence will be dealing with terms
7 and conditions, basically through No. 74 through to No.
8 93. Specifically the topics that are to be covered by
9 this panel in the first main subject area is review and
10 revision of implementation and is -- and the role of
11 the provincial technical committee. That evidence will
12 be given by Mr. Kennedy and relates to terms and
13 conditions 74, 77 and 78.

14 The next general subject that will be
15 dealt with is information collection management, and
16 within that topic we have Dr. Osborn who will be
17 providing evidence on integrated natural resources
18 inventory systems, silvicultural treatment affecting
19 this monitoring and timber management planning
20 information systems. That information that Dr. Osborn
21 will be speaking to is in response to terms and
22 conditions No. 79 and 80.

23 Following that we will have evidence
24 presented by Mr. Uhlig, and Mr. Uhlig will be dealing
25 with forest ecosystem classification and ecological

1 land classification.

2 We then switch to another broader topic,
3 which is scientific research and technological
4 developments. And in that section we'll be touching
5 briefly on old growth with Mr. Kennedy who will be
6 speaking to term and condition No. 7.

7 And then to a series of topics that will
8 be dealt with by Dr. Ken Abraham. In that case Dr.
9 Abraham will be dealing with biological diversity of
10 landscape management, other wildlife effects monitoring
11 and wildlife population monitoring. In doing that, Dr.
12 Abraham will be addressing terms and conditions 67 and
13 90.

14 We will then be moving to Mr. Watt, who
15 will be discussing the subject matter of habitat supply
16 modelling which is in relationship to our term and
17 condition No. 90.

18 From there we go back to hear from Dr.
19 Osborn once again in the subject matter of geographical
20 information systems and that's in relation to term and
21 condition No. 91.

22 In concluding the panel, we'll have to
23 hear from Mr. Kennedy again on the subject matters of
24 training and professional in relation to term and
25 condition 92 and reporting requirements in relation to

1 term and condition 93.

2 Madam Chair, I thought it would be
3 appropriate to make an offer to -- it may be helpful to
4 the Board if I was to provide a brief summary at the
5 end of the day, particularly dealing with the subject
6 matter of scientific research and technological
7 developments and how those relate to timber management
8 planning and the undertaking that we are here for
9 discussing with you, and I would promise to take only
10 approximately five minutes to do that.

11 I should like to move to you that there
12 are some terms and conditions that are contained in the
13 statement to be moved for other panels that are yet to
14 appear before you. For instance, growth and yield
15 will be dealt with in Panel 5.

16 You may be pleased to know that there are
17 also several subjects dealt with by Panel 3 that we
18 have chosen not to lead any further evidence on. We
19 have relied upon the written evidence that's contained
20 in the statement and and occur in correspondences to
21 you. Just to list the main topics, the main headings
22 are Timber Management Planning Manual Revision; the
23 Timber Management Planning Manual Brochure, which we
24 have in our main production for public distribution;
25 the Northern Ontario Wetlands Evaluation System; the

1 completion of the ANSI surveys, and Visual Resource
2 Management for all the topics that we have chosen not
3 to give any further evidence at this time.

4 We will advise you, however, that we do
5 intend to spend a couple of extra minutes dealing with
6 Dr. Abraham and Dr. Osborn and Mr. Uhlig, so we would
7 expect to take most of the day today in leading
8 evidence in Panel 3.

9 MR. FREIDIN: Madam Chair, perhaps we
10 could mark as the next exhibit the series of overheads
11 which will be used by Mr. Kennedy in relation to the
12 first topic that he's going to speak to, implementation
13 manuals, which they, I guess, would be Exhibit 2282.
14 The overheads are entitled: Implementation Manuals of
15 Provincial Technical Committee, Review and Revision and
16 Revision of Silvicultural Guides. The overhead is five
17 pages in length.

18 ---EXHIBIT NO. 2282: 5-page Overhead entitled:
19 Implementation Manuals of
20 Provincial Technical Committee,
Review and Revision and Revision
of Silvicultural Guides.

21 MR. KENNEDY: Madam Chair, turning if I
22 could to page 2 of Exhibit 2282, we offer a very brief
23 discussion of provincial technical committees.

24 MNR's described in its term and condition
25 No. 74 -- Mr. Baker would you...

1 ---Overhead displayed on screen.

2 MR. KENNEDY: MNR has described in its
3 term and condition No. 74 for proposal for the
4 establishment of a provincial technical committee. So
5 idea for the committee has come about as a result of
6 negotiations where there were suggestions made by
7 several parties that we should put in place a standing
8 committee comprised of both government and
9 nongovernment experts to ensure that we have an
10 accurate role for experts outside MNR, providing advice
11 in relation to implementation manuals. And we've
12 accepted that suggestion and come forward with our
13 version of the proposal.

14 The main role of this committee is to
15 provide advice to MNR in relation to the priorities for
16 the creation of new implementation manuals and revision
17 or amalgamation of existing models. It was felt that
18 it was appropriate to involve outside experts in the
19 setting of those priorities.

20 We've also acknowledged that it would be
21 appropriate to ask that committee to provide advice on
22 suitably qualified persons to participate in the
23 development of those manuals and in revision or
24 amalgamation of existing ones.

25 Again, the suggestion has come forward

1 that there were other experts who could provide us with
2 the benefit of their experience and knowledge in
3 determining that information. We made, as one other
4 step in our move towards trying to get best information
5 available as well as to be able to say to individuals
6 and the public that indeed we're looking outside the
7 expertise contained in MNR.

8 We hope by having this provincial
9 technical committee in place as a standing committee
10 that the implementation manuals will be kept current as
11 a result of their review and input. We also believe
12 that it will enable us to ensure that, and we get
13 scientific and technological advances in corporate
14 interim manuals as they become available. We believe
15 we can do that by ensuring that we have qualified
16 individuals on the provincial technical committee. And
17 we also make note of the fact that we intend to
18 establish that committee with a range of interests and,
19 hence, we think we will be able to cover all aspects of
20 implementation named in the program.

21 On page 3, then, of this Exhibit 2282, we
22 then provide a brief description of the information
23 we've contained in our term and condition No. 77, which
24 was some specific proposals to ensure that the manuals
25 are kept current.

1 We've listed the manuals in the Appendix
2 No. 7 and currently there are 28 manuals listed, the
3 majority of which are in use at this time.

4 This is indicating that one of the main
5 roles of the provincial technical committee will be of
6 an integral part of setting the priorities for the
7 revision of the manuals and the intent is to ensure
8 that the manuals are kept current with scientific
9 knowledge that's applicabe to this material.

10 In setting that priorities we have listed
11 a number of factors to be considered, and, again, as a
12 result of some of the input that we received during our
13 negotiation session. We listed those as being the
14 results of applicable scientific research; the results
15 of our ongoing monitoring programs; the advantages and
16 disadvantages of changes to current timber management
17 practices, again this as an analytical operation of
18 technology.

19 The second last point, the advantages and
20 disadvantages changes to current timber management
21 practices deals with the need to consider at what point
22 we have sufficient knowledge that would warrant the
23 total revision of a manual or the creation of a new
24 one, rather than issuing bulletins for procedures to
25 our staff to be aware of a particular point which may

1 just be recent.

2 We've also undergone discussion in this
3 hearing room and outside on the need to establish a
4 revision schedule for the manuals.

5 We are relying heavily on the manuals in
6 timber management planning, and I can advise you that
7 in the past we have not had occurring from MNR to have
8 a schedule on a review of the manuals. It would be
9 important for us to commit to this need, ensuring the
10 manuals are kept up-to-date to determine if there is a
11 need to revise them. And therefore we proposed in the
12 terms and conditions that each implementation manual
13 will be reviewed within five years of the year of
14 approval and thereafter we'd be reviewing at least once
15 every five years.

16 Also we recognize that the actual review
17 of the manuals or the creating of new ones will lead to
18 have the draft manuals be reviewed by outside agencies
19 who have identified it was appropriate to include other
20 government ministries and agencies, as well as the
21 provincial organizations' associated expertise in the
22 subject matter being dealt with.

23 In the case of obtaining public
24 involvement in the manual reviews, I think it's
25 appropriate to include representatives and local

1 assistance in the review of draft manuals. We believe
2 that the expertise that the local citizens committee
3 will be gained in their experience in preparing the
4 plans involved in implementation, that they will be a
5 good source of information for providing very directed
6 experience to our science team in preparation for the
7 manuals themselves.

8 When we were setting the priorities and
9 full revisions by putting in place a regular schedule
10 for review and by having a variety of experts involved
11 in the subject matter during the draft planning --
12 draft manual reviews, we do believe that we can end up
13 with up-to-date manuals for use in timber management
14 planning, and we based on scientific knowledge to the
15 terms and conditions and we would benefit from the
16 involvement of other experts.

17 And on page 5 of this Exhibit 2282 we
18 make note of our commitment which is contained in our
19 terms and conditions No. 78A, which is to revise our
20 silvicultural guideline. And the Board will recall we
21 discussed many times over many days the goals the
22 silvicultural guides have as a key source of
23 information in preparing silvicultural ground rules in
24 timber management plans. It is important to keep that
25 information up-to-date. We have embarked a -- or we

1 are going to be embarking on a program of ensuring that
2 our existing silvicultural guides are up-to-date and
3 that they do reflect scientific knowledge as it applies
4 to Ontario.

5 We also have advised the Board of the
6 understanding that we have reached with the Ministry of
7 the Environment on the concept of general standard site
8 types and the Board has heard evidence on the need to
9 incorporate that concept into our silvicultural guides,
10 our term and condition No. 78 makes that commitment
11 firm.

12 In order to ensure that we get on with
13 the task we've also comitted another term and condition
14 to complete these revisions within three years of a --
15 of the EA approval. We believe it will take us about
16 that time to ensure that the guides have undergone the
17 scientific review and that we incorporated the general
18 standard site types.

19 In this fashion we expect that we'll be
20 able to ensure that the current and best information is
21 available for R & D's use involved in termination
22 planning and other uses that the guides are put to.

23 And, Madam Chair, unless there are any
24 questions from the board I have a notation that says
25 that concludes that portion of evidence.

1 MADAM CHAIR: No. No questions, Mr.
2 Kennedy.

3 It was the Board's recollection that the
4 idea of a provincial technical committee had been a key
5 proposal in the case put forward by the OFIA. Is the
6 the Board to understand that the OFIA and the other
7 parties are in agreement with this proposal as you have
8 put it forward today?

9 MR. KENNEDY: Yes, I believe that is a
10 correct statement, that the other parties are
11 supportive of the provincial technical committee, and
12 I believe that's reflected in the Illing report and in
13 the statements/submissions of the administrative panel.

14 I would make a point, though, that so as
15 not to leave the impression that we have totally
16 accepted all of the proposals of OFIA, we did make a
17 number of other proposals for additional committee
18 structures which MNR has chosen not to accept at this
19 time, particularly dealing with revision of policy
20 committee and this is not to be confused with that,
21 this is a committee of technical experts to advise on
22 the implementation manuals.

23 MR. MARTEL: Is this why you don't have
24 agreement on T&C 78, to see that there's no agreement
25 in the Illing report.

1 MR. KENNEDY: I may need to be -- I may
2 need to be corrected on this matter, but I believe the
3 reason that in the Illing report we cannot have
4 agreement on term and condition 78 is because of the
5 different style proposal that has come forward from
6 Forests For Tomorrow dealing with silvicultural
7 standards and approach to business, rather than use the
8 silviculture guide.

9 I would ask Mr. Lindgren if that's the
10 correct reflection of his recollection of the
11 situation.

12 MR. LINDGREN: That's fairly accurate,
13 and as well we had some concern with 78B in terms of
14 the development of environmental guidelines.

15 MR. FREIDIN: Madam Chair, perhaps before
16 Dr. Osborn gives his evidence we could mark as the next
17 exhibit which I understand would be Exhibit 2283, the
18 overheads that he will speak to during this portion of
19 the evidence. Its a document entitled: Information
20 Collection and Management and it indicates that he will
21 deal with three subjects: Integrated Natural Resource
22 Inventory System; Silvicultural Treatment Effectiveness
23 Monitoring System and Timber Management Planning
24 Information System. It's a document which is 34 pages
25 in length.

1 ---EXHIBIT NO. 2283: 34-page Overhead entitled:
2 Information Collection and
 Management.

3 DR. OSBORN: Madam Chair, I have the
4 privilege of explaining some of the new alphabet soup
5 within the Ministry of Natural Resources. And to start
6 off with, there are a set of four slides that have the
7 same format to try and put what I have to say in the
8 context as far as MNR is concerned.

9 Essentially, we're still driving towards
10 information and information systems that support timber
11 management planning. With essentially or very
12 simplistically three basic questions: What have I got?
13 What have I done? What can I do?

14 And in 1989 in the main evidence of MNR
15 there was some explanations from a variety of panels as
16 regards 'what have I got?' which was the forest
17 resource inventory, plus other information; the 'what
18 did I do?' which was described in panels speaking to
19 the timber management planning tables, and the records
20 out of the silviculture information system and
21 assessment system; and to 'what can I do?' or the
22 planning that was also in the timber management
23 planning tables and the idea of the silvicultural
24 guides. So this was a sort of scene that had been
25 described to you in 1989.

1 What I would like to briefly do today is
2 to describe where has that moved to by 1992.

3 And so the new set of words is -- or the
4 new set of alphabets is INRIS: Integrated Natural
5 Resource Inventory Systems. Within the both history
6 and the planning part there are some announcements in
7 the system called "STEMS" which is a build upon
8 silvicultural informing system and assessment system
9 and developments taking place in something called
10 "TMPIS", timber management planning information system,
11 which again is an enhancement or augmentation of the
12 tables in the timber management planning that you've
13 heard about before.

14 Just to sort of a last slide in this
15 series that brings up what is it particularly that I'm
16 trying to put across in terms of messages, and that is
17 an emphasis in the idea of more, better and/or
18 accessible data pertaining to the subject matter; some
19 of the ideas of linking the whole silvicultural
20 prescription plan treatment result, as a continuum; and
21 the idea in timber management planning, particularly,
22 and having the data and the tables and the procedures
23 to both compile and sort of report on that information
24 in a more consistent fashion that makes therefore
25 searching, retrieval and display that much easier.

1 So that's the main messages that I'm
2 trying to convey in this explanation.

3 If I can step back for just a moment,
4 back in '87/'88 the Ministry had launched itself upon a
5 task to produce a document called an "information
6 technologies strategic plan." And this a requirement
7 by management board of all ministries who are in the
8 information management business; this information board
9 demand this overall fabric to describe which each
10 ministry is doing. And MNR had started upon this not
11 only because management board directed it, but because
12 MNR also felt that this information management was a
13 necessity to support the overall management intent of
14 the ministry, as has been proclaimed in something
15 called "Directions 90s" which I believe has already
16 been exhibited by the Ministry of the Environment, and
17 I do not know the exhibit number, but Directions 90s is
18 a document that you already have had given to you.

19 And in essence, as this slide infers, the
20 overall goal within the Ministry on that document was
21 the idea of sustainable development, and to that end
22 there were three supporting strategies which are
23 described on that slide: The idea of partnerships, the
24 valuing of resources and improved knowledge base, and
25 this information technology strategic plan was a set of

1 the data and systems and technology that was supportive
2 of that end goal.

3 So the ITSP, this information technology,
4 is very much a means to an end, the end being the
5 management under the mandate of MNR. Within the
6 information technology strategic plan, there was an
7 assessment made of the entire data requirements of the
8 Ministry.

9 Now, so that's not a misleading comment,
10 that doesn't mean that we have to the nth detail a list
11 of every single piece of information with it's
12 description of that which MNR requires, but we do have
13 a rather generic idea of the total information
14 requirements of the Ministry, and in a way that's
15 summarized on diagram 7 in Exhibit 2283.

16 And, as you can see, in the left hand
17 side on that diagram there's four basic sets of
18 information. There's an underlying survey fabric
19 describing Ontario, and given the mandate of MNR this
20 is a rather fundamental piece of knowing where you are
21 or where anything is happening in this underlying
22 survey fabric. Built on top of that is a description
23 of all the natural resources for which MNR has a
24 mandate. On top of that again, because the Ministry is
25 an active -- an operational Ministry, there are those

1 systems in the information for those systems dealing
2 with what activities actions have taken place, and
3 finally on top of that pyramid, there is a fourth major
4 box dealing with the administration aspects of
5 personnel, finance, budget.

6 Particularlly what I have to say this
7 morning, I'm going to speak primarily to the two middle
8 columns in diagram 7, dealing with natual resource
9 inventory and natural resource management systems. So
10 the concentration of what I have to say is in those
11 middle two layers of this diagram.

12 And, again, to try and put this in
13 perspective, partly based on some questions that have
14 come about as regards the priorities in the setting of
15 what I have to say, within the information technology
16 strategic plan, diagram 8 gives you an understanding of
17 the array of different activities going on within MNR
18 of information management system developments.

19 There is a whole plethora of them, and
20 this diagram 8 identifies which ones are in the
21 planning phase which are in the feasibility study,
22 which actually are being designed; which ones are being
23 run as pilot as ongoing one- or two-location trial;
24 which ones actually are being implemented and which
25 ones are actually in production.

1 And I set this diagram up to again give
2 the Board indication of there is a whole array of
3 activities, and should we come to "what is the priority
4 of..." or "why don't we fast track any one of these
5 particular items?" is there a duplication of "what else
6 drops off the table?"

7 Given all of that, let's move into one of
8 these three, particularly the one called "INRIS."

9 INRIS was identified quite early on
10 within the information technology strategic plan as an
11 information system or set of systems that was deemed to
12 be of vital importance to the Ministry. And given what
13 the Board has heard over the last three or four years,
14 it's not very surprising.

15 INRIS has an array of objectives and most
16 of these are relatively straightforward and I don't
17 intend to read all of them, there's a couple of them I
18 will pick up, though. If we come down the list, the
19 sixth one, which speaks to be able to maintain the
20 integrity of the MNR program information in an
21 integrated environment.

22 INRIS is concerned with, and the
23 challenge was, how can we integrate these different
24 natural resource information pieces together? And I'll
25 explain what "integration" means in a moment. But

1 there's a real concern that in the integration process
2 we do not degrade any one of the individual layerings
3 of information. So there is some concern in the people
4 aspects of this information system that we recognize
5 the quality of any of the information sets and the
6 information integration process.

7 And within MNR this is quite an important
8 facet. You can't just throw all of these information
9 sets together in a hopper and expect it to come out as
10 a nice integrated package without some potential
11 degradation things.

12 Right now INRIS has just completed a
13 feasibility study, the front end of an information life
14 cycle. Now, that feasibility study itself had two main
15 objectives. The first was to see whether or not the
16 eight initial sets of data that were thrown into INRIS,
17 whether it's feasible to in fact put those things
18 together, whether it's possible to in fact integrate
19 these information sets at all.

20 And the second objective in the
21 feasibility study was to ascertain which particular
22 subset, which particular pieces of that entire array of
23 items could MNR seriously get ongoing and make
24 operational in an integrated sense faster than others.
25 Which was the priority ones? What was practical? And

1 I'll speak to that.

2 Again, to set the record straight, INRIS
3 is specifically an inventory system as opposed to a
4 management system as opposed to a decision support
5 system and a, if you like, a gentle reminder of
6 inventory which speaks to identity, quantity, quality
7 and location. And I frequently have to use this slide
8 in explanation as to what INRIS is to keep reminding
9 people that this integrated inventory is not a panacea
10 for management; it is certainly the idea of a step
11 forward of trying to tie these things together in a
12 realistic fashion, but it is not an answer to the
13 entire management requirements within MNR.

14 The first -- okay, this is a slight pause
15 because I have a logistical difficulty of, you have a
16 slide in front of you in the hard copy, which is slide
17 No. 12, which deals with integration which at this
18 point in time I don't have a transparency. So I think
19 in the hard copy there is a slide No. 12 which I will
20 briefly explain as to what do we mean by the word
21 "integration"?

22 The particular diagram, diagram 12 in
23 Exhibit 2283 has three main pieces of the word
24 "integration." The most obvious one, in a way, is the
25 idea of multi-resource integration, and that's how can

1 we sensibly put together data describing fish, water,
2 vegetation, minerals such that for any piece of
3 geography we can describe what's there for a whole
4 array of different themes, different sets of data? How
5 can we realistically tie those things together?

6 And that's very often what many people
7 think of if they think of integrated inventories.

8 However, there's also the idea of
9 integration in the concept of "what have I got at the
10 district and how does that tie together with what have
11 I got at the region and in turn how does that roll up
12 to a set of information for the province as a whole?"
13 And the Board has heard on several occasions this idea
14 of roll up from one layer of geography to another layer
15 of geography. So we have this idea of multi-level
16 integration.

17 The third concept that's on diagram 12 is
18 the idea of temporal integration. INRIS will
19 particularly contain "what have we got out there
20 today?", but INRIS will also contain records of "what
21 was there yesterday." And given for many scientific
22 things that trend through time, monitoring comparison
23 evaluation is important. That temporal integration
24 concept is very important.

25 And the most obvious comment to make here

1 is if you change the methodology of measurements
2 yesterday from the way you do it today, that temporal
3 integration becomes much more complex and yet that
4 trend through time is very important.

5 Now, there's a whole array of other
6 facets of integration within INRIS, but those three in
7 particular I want to bring to your attention.

8 As a feasibility study, INRIS started off
9 with eight particular layers of information that we
10 were to try to integrate, and it very soon became
11 apparent that the eight for which MNR had the mandate,
12 the eight was not exhaustive enough if we were to
13 really do what we intended to do. And so the scope has
14 got increased beyond the eight and there's a set of
15 slides showing you how we build up to where INRIS is
16 now trying to go.

17 The first slide, slide No. 13, says what
18 we need to do, although it wasn't in the original
19 mandate, is think about topography. The overall base
20 fabric, survey fabric and the ups and downs of the land
21 and the drainage.

22 Building on top of that, there was some
23 other facets of information that were needed, and the
24 two that are on diagram 14, the two new ones, are soils
25 and climate. And for those two facets, MNR doesn't

1 have a sort of distinct, unique mandate for those two,
2 so INRIS needs to either acquire and/or access those
3 kinds of data.

4 Slide No. 15 speaks to adding to those
5 three the idea of a vegetative component, in this case
6 the box says "forest resource inventory", and if we
7 were to put those four things together, it's possible
8 that we can create or derive the idea of a forest
9 ecosystem classification and associated inventory.
10 And, in fact, those four boxes, particularly if you
11 turn FRI into a vegetation box, really are the
12 fundamental pieces of information behind ecosystem
13 classification.

14 The additional box on slide 15 is a
15 recognition of the natural heritage information for
16 which MNR does have the mandate, which is information
17 dealing with rare, threatened and endangered species
18 and spaces.

19 Slide No. 16 says, that's fine, but let's
20 build it even bigger, closer to where INRIS was
21 supposed to be aiming. And here the idea is of an
22 ecological land classification as the long-term intent
23 in terms of an integrated inventory that would build
24 upon what has come out of the forest ecosystem
25 classification. We could build on information from

1 wetlands, from natural heritage and, in turn, set some
2 linkages off with wildlife habitat.

3 So INRIS is now building towards or
4 thinking of that sort of scope and those sorts of
5 components, and slide No. 17 ends up with the full
6 scope of what INRIS is supposed to speak to and will
7 speak to over time.

8 So the wildlife habitat is linked to and
9 related to the idea of the wildlife populations, which
10 will be a part of INRIS. Not only are there wetlands
11 included, but there's also water included, and OFIS is
12 the Ontario Fisheries Inventory System. And on the
13 right hand side of diagram 17, other thematic layers
14 deal with aggregates - gravel, sand; oil and gas; an
15 item called "developed features" which is a mixture of
16 man-made things like roads, bridges, dams and rather
17 more abstract things like views; and some cultural
18 items like spirit sites.

19 So slide 17 sets the scope of what INRIS
20 is to speak to over time.

21 Within the feasibility study, that second
22 objective was to try and identify what particular
23 pieces of this story can MNR realistically put into
24 operational practice within the next two to three/four
25 years. So out of that array of components that I've

1 just described, the feasibility came up with what were
2 deemed to be best bets.

3 And there are seven items listed on slide
4 18. At this point in time the decision within MNR is
5 to take and work on the top four. That's not to say
6 that the lower three, to do with fire and wildlife
7 habitat and wildlife population are ingnored, but at
8 this point in time for the next two or three or years
9 INRIS will concentrate on the top four in INRIS as
10 integrated inventory.

11 I'm briefly going to describe in a little
12 bit more detail about two of that top four. I'm going
13 to skip over the infrastructure, which is rather
14 technical, and I will speak a little bit more about
15 what does derived FEC mean, and what does enhanced FRI
16 mean for INRIS.

17 I will not specifically speak to the
18 natural heritage inventory, primarily because the
19 concentration in the next two to three years is the
20 work in Southern Ontario and outside the area of the
21 undertaking.

22 Slide No 20, in Exhibit 2283 talks about
23 derived forest ecosystem classification. The intent in
24 INRIS in the next two- to three-year period is to come
25 up with a process, a methodology technique of producing

1 or being able to produce mapped forest ecosystem
2 classification polygons. Simplistically, it means much
3 like as the Board have seen, a forest stand map in the
4 forest resource inventory, a bunch of polygons with
5 labels that describe what the trees look like, and the
6 intent in here is to produce a similar kind of product
7 with polygons where the label is "what are the
8 ecosystem criteria indicators measurements that are
9 useful?" And later on Mr. Uhlig will describe what
10 some of those parameters might be in his description of
11 ecosystems.

12 Derived FEC: It is possible that the
13 Ministry of Natural Resources could have gone out with
14 an army of people and done a whole array of ground
15 surveys and measured in a multitude of places what
16 actually they found, put it into a classification and
17 had an inventory. And the estimation was that sort of
18 process was at least as traumatic as the forest
19 resource inventory which cost 50 million bucks just to
20 cover two-thirds of the province, and at this point in
21 time the Ministry doesn't have another \$50 million to
22 spend on ecosystems, so it wouldn't be possible to try
23 and derive this kind of information from existing data
24 sets. And that's the intent in the word "derived", is
25 to take either existing and/or available information

1 that is relevant to the ecosystem fabric and see how it
2 can be put together to derive those ecosystem polygons.

3 MS. BLASTORAH: Q. Dr. Osborn, could I
4 ask you to slow down just a little bit for the court
5 reporter. She's not familiar with the technology, and
6 I believe it's a little difficult for her.

7 DR. OSBORN: A. Okay. Yes, I will try
8 to so do.

9 The four particular pieces of information
10 directly relevant in this, in this idea of derived
11 ecosystems, are those of topography, soils, climate,
12 and vegetation. And if we remember back to the array
13 of slides that I had in the components of INRIS, and
14 the fact that some of these were not in the original
15 scope, they obviously have been needed if this is an
16 important priority, which it is so.

17 The intent also in INRIS is to try and
18 automate the process of putting these pieces of
19 information together, these data sets of soils and
20 topography climate together to automate it as much as
21 possible, so this is very much a computer-driven
22 process with human intervention.

23 If it's to be done manually, it would be
24 quite a time consuming and very labourious process.
25 Already within MNR there has been some experimentation

1 of doing just this, so INRIS is not necessarily
2 breaking brand new ground; in the R & D sense, INRIS is
3 looking at the making of this operational, and, hence,
4 the comment that we will leverage ongoing work. And
5 this has been tried in parts of the province to some
6 degrees of success.

7 There is definitely a limitation that not
8 all of the data sets that are described, the four data
9 sets are immediately available in the right form across
10 the whole of the province. And this will give rise to
11 why we will do some of this work in certain areas
12 rather than others. It will also explain why this will
13 not happen as a complete provincial coverage in the
14 next three years.

15 MR. FREIDIN: Q. Dr. Osborn, when you
16 refer to having a product in the next two to four
17 years, I have a note that you are referring to a
18 technique to map effect polygons will be developed in
19 the next two to four years; is that correct?

20 DR. OSBORN: A. Yes. There will be the
21 development of this technique in that time frame, and
22 the intent within that time frame is at least to
23 demonstrate the technique is proven by having one or
24 more or two physical hot little products in one's hands
25 that can convince the user this is worthwhile and this

1 is useful; this is, yes, what I want. So that there
2 will not be complete provincial coverage of an array of
3 maps in this fabric but there will certainly be a few.

4 Q. And what sort of factors will affect
5 the rate at which one could actually prepare the kind
6 of tech maps you're talking about across the area on
7 the undertaking?

8 A. Two or three factors. The most
9 obvious one is the availability of these four sets of
10 data in the right form and format. So, as an example,
11 let's take one of them, topography.

12 The topographic data set that will be
13 used in part of these process is the Ontario base map,
14 and the Ontario base map in digital form will not be
15 available across the entire province, at the estimate
16 at the moment, to the year 2004 which is a little bit
17 more than three years beyond 1992.

18 The second feature that would cause this
19 not to be complete coverage in three or four years is
20 although this has been tried as an experiment in
21 research and development mode, making it an operational
22 cost effective process has still yet to be proven. And
23 although INRIS is rather optimistic that this can be
24 done, there are quite potentially, quite possibly some
25 things that will go wrong come year 1, year 2, year 3

1 as in any systems development. So the technology in an
2 operational sense is not yet proven. And we might find
3 by year three that this particular process may work
4 exceptionally well in parts of the province, but with
5 some real difficulties in other parts.

6 And the most obvious example I can think
7 of is Southern Ontario, understandably outside the area
8 of the undertaking, but because of the human
9 disturbance in Southern Ontario, the idea of taking
10 these four parameters and turning it in ecosystem
11 fabric is almost certainly going to be much more
12 challenging than the relatively undisturbed north.

13 Q. Dr. Osborn, I understand that you are
14 familiar with the evidence given by the Ontario
15 Federation of Anglers and Hunters, and know of the
16 coalition, back in their panel No. 6 in which they
17 discussed their hope to biodiversity; is that correct?

18 A. Yes, I am.

19 Q. And during that evidence there was
20 discussion of a document marked Exhibit 2095 which
21 referred to the development or the preparation of
22 derived FEC maps in the northern region; are you
23 familiar with that particular exhibit?

24 A. Yes, I am.

25 Q. And can you, without going into any

1 detail, can you advise whether the derived FEC maps
2 which were the subject matter of that exhibit were
3 similar to or different than the type of derived FEC
4 maps that you are speaking about today and which is
5 referred to in witness statement No. 3?

6 A. The concept was similar, the idea of
7 trying to derive an ecosystem fabric from an additional
8 or an existing data set.

9 If I understand correctly or remember
10 correctly, that particular study looked at using just
11 the forest resource inventory, except where - if I
12 again remember correctly - the experiment was most
13 successful, the forest inventory data used was that
14 that had already been augmented on the Gordon Cosens
15 Forest with some additional information, and also in
16 the study there was a piece of information used to do
17 with the prime land inventory, and so the particular
18 reference Mr. Freidin is making is where they were
19 trying to derive or see whether they could derive FECs
20 from just the FRI or an FRI and another additional
21 piece of information.

22 And, as I say, conceptually this is
23 similar. I'd say FECs in INRIS will be derived from
24 four pieces of information, four rather fundamental
25 pieces of information.

1 If, in fact, it could be derived from one
2 of them very successfully, it should be a much more
3 cost effective and cheaper process. If, however, the
4 product, that ecosystem product, is of limited value or
5 no better value than the existing information from
6 which it was derived, you don't gain very much by going
7 through the mechanics. And, again, if I remember from
8 that piece of information, the only way they could make
9 that ecosystem fabric result from just the FRI alone
10 was to end up with what we call "ecosystem complexes"
11 or "aggregates of different pieces of the ecosystem
12 fabric."

13 There isn't - and it's not very
14 surprising - across the province a nice, neat match
15 between a forest inventory polygon and a forest
16 ecosystem polygon. It isn't a one-on-one relationship.

17 MR. FREIDIN: Now, Madam Chair, we're
18 going to discuss this in a little bit more detail
19 later. Mr. Watt had some involvement in relation to
20 that specific subject in the northern region which was
21 the subject matter of discussion by Dr. Quinney and I
22 intend to review that particular evidence with Dr. Watt
23 to really address the issue as to whether, in fact, the
24 use of the derived FEC maps as discussed in that
25 exhibit would be useful or not in terms of the

1 achievement of OFAH's objectives as they stated them in
2 their panel No. 6, but we'll leave that to Mr. Watt.

3 I just wanted to clarify whether there
4 was a difference between derived FEC maps as discussed
5 in the witness statement here, for instance, on page
6 16; and derived FEC maps was discussed in OFAH's panel
7 No. 6. I think that has been addressed.

8 Q. And perhaps you can just move on, Dr.
9 Osborn.

10 DR. OSBORN: A. The second of the four
11 priority subsets within INRIS and the other one about
12 which I need to explain a little bit further is that
13 which is called "enhanced foresty resource inventory."

14 At long length in Panel 3, the Board
15 heard what forest resource inventory was. What we're
16 trying to do in the enhanced part is pick up on the
17 criticisms that came out of that evidence.

18 Trying to enhance the forest resource --
19 actually, trying to advance -- enhance the forest
20 inventory, I would sooner describe it as, in
21 potentially four different ways. There's a requirement
22 perceived within MNR to try and have those forest
23 inventory data at a more operational level of
24 reliability.

25 And a couple of things spring out of this

1 in terms of enhancement. There needs to be additional
2 pieces of information associated with the forest stand
3 description, over and above what the FRI currently has.
4 That could be both describing the trees aspect and it
5 could also be the idea of describing other pieces other
6 than just the trees, for example, some descriptions,
7 perhaps, of the vegetation. So there's the need for
8 the idea of enhancement with additional pieces of
9 information.

10 There's also the need in an enhancement
11 sense of having those data more current or more
12 up-to-date than today. Let's have a consistent way of
13 keeping those data up-to-date.

14 Related to that, in a way, is the idea of
15 having those data - I'll use the word "more
16 accessible" - more consistently accessible to whomever
17 wants. This, in a way, is a technological issue, how
18 you end up with these in a computer that that is easy
19 to put in, easy to get out.

20 And the last part of the enhancement is
21 to perhaps have some of the information within the
22 existing forest resource inventory perhaps more precise
23 than it currently is. And an example again the Board
24 is relatively familiar with is the idea of volume
25 estimates associated with forest resource inventory.

1 Now, to that end, within INRIS we will
2 look at -- and there's ongoing work in this already, of
3 other technologies that will make these data easier
4 accessible, perhaps more precise, perhaps more current,
5 like remote imagery, there is the idea of incorporating
6 information from other systems that perhaps are related
7 to the inventory. And, again, I'll use an example that
8 the Board has heard described before, and I will come
9 back to in about ten minutes, and that's within
10 silviculture, the forester measures those trees which
11 are or are not free to grow. And from a silviculture
12 effect in this point of view, that's an important
13 measure, but also it also causes a change in forest
14 resource inventory. So maybe having that sort of
15 linkage between a system describing silvicultural and a
16 system describing inventory could be improved. Will
17 be.

18 So INRIS will look at and is prepared to
19 work as a priority in looking at the ways and means of
20 improving the forest inventory component.

21 As I mentioned and as asked, I don't
22 intend to speak to slide 22 dealing with natural
23 heritage per se, and I would like to come to the last
24 slide in the INRIS story which is a relatively complex
25 diagram, but it tends to set a picture of INRIS in

1 relation to other pieces, particularly two other pieces
2 I want to talk about next.

3 Inside the thick, black line on diagram
4 23, it's the thick, black line that I -- that defines
5 the boundary with a label in it of "INRIS." Within
6 there is really what the INRIS is all about, made up of
7 two main pieces. And, in fact, the infrastructure
8 project that I have not described at all as a priority
9 really deals with the internal mechanics of how that
10 will work. But I want to make one brief comment of
11 what's inside that line. There are two boxes. There's
12 a box called an "observation library" and the analogy
13 with the library is most appropriate. It is literally a
14 place for people to put and store and from where they
15 can retrieve information they have collected dealing
16 with the inventory of natural resources.

17 Within MNR and within MNR's partners
18 there is a whole array of information collected on both
19 a corporate and an ad hoc basis and there isn't a neat,
20 tidy place, consistent place, to put that, find it, and
21 retrieve it. And so the analogy of a library is most
22 appropriate.

23 So the library will often contain the
24 most up-to-date and most current but not integrated
25 pieces of information to do the inventory. There will

1 be no intent within the library to integrate pieces
2 together. Fisheries data will be pure and kept
3 separate from timber data; but the library will be the
4 most obvious place to go and look if you want to know
5 something specific and up-to-date about an individual
6 piece of inventory. An individual theme.

7 By contrast, the other box within the
8 INRIS overall label is the INRIS database and there
9 would be a whole array of technology taking data from
10 the library and integrating it in the integrated
11 database, which means the database will be where you go
12 to find, if you're standing in this room, "what have I
13 got in this room in terms of moose, trees, soils,
14 climate holistically within this room?" That will be
15 in the database.

16 If you want to know what's the most
17 latest estimation of moose in this room, you would
18 typically go look in the library.

19 The internal mechanics of how to make all
20 that work is what the infrastructure project is all
21 about. And there is a whole array of both biological
22 technologies, GIS technologies, information management
23 technologies to make that work.

24 More relevant perhaps in slide 23 is the
25 relationships between INRIS and what is in the bottom

1 left hand corner of slide 23, a set of boxes labeled
2 "resource and data management systems."

3 INRIS will both receive and be the public
4 area for that array of resource and management systems,
5 and there's two particular systems in there that I will
6 speak to.

7 And I'm not sure at this point in time
8 if somebody else wants to call it quits or... Because
9 it's a logical place and a personal basis to break what
10 I'm talking about.

11 MADAM CHAIR: Thank you for your
12 suggestion. You are old hand at this, Dr. Osborn.

13 We will be back in twenty minutes.

14 ---Recess at 10:15 a.m.

15 ---On resuming at 10:36 a.m.

16 DR. OSBORN: Madam Chair, if I can launch
17 into what the silvicultural treatment effectiveness
18 monitoring system is about. You can see why we use
19 acronyms; "STEMS" is much easier to say.

20 MR. MARTEL: How do you possibly remember
21 them all?

22 DR. OSBORN: Slowly and with difficulty,
23 Mr. Martel.

24 Again, STEMS has just completed a
25 feasibility study essentially looking at how we can

1 improve on the set of procedures for recording what has
2 been doing silviculturally and what the results were.
3 And so there was two specific business goals associated
4 with STEMS. Literally to have the practicing forester
5 improve both efficiency and effectiveness of that which
6 he or she was doing, and, in addition, to improve the
7 way in which both those practices and the results and
8 the effectiveness of those results could be reported
9 and described.

10 STEMS is -- was an effort to look at, a
11 recent effort to look at, a rather holistic view of
12 silviculture as an information management system, and
13 so there's a variety of pieces inside it. And slide 25
14 describes some of those major pieces, those major
15 business functions, parts of the business associated
16 with the system.

17 The first one is the idea of having
18 things like silvicultural guides, things like the tool
19 for techniques used in silviculture; having those in a
20 single place in an electronic medium so they are more
21 easily accessible and available for the practicing
22 forester.

23 The next three main business functions
24 deal with, if you like, the three key operational
25 facets of STEMS: Being able to write the prescription,

1 being able to document the treatment, being able to
2 document the result.

3 The fifth item on slide 25, the fifth
4 business function, deals with the ability of linking
5 that prescription treatment result and being able to
6 understand and thus monitor how effective were both the
7 prescriptions and the treatments.

8 And the last business function deals with
9 the reporting of the same.

10 There's then three slides, 26, 27 and 28,
11 which are a sequence and they list some fifty pieces of
12 information which in jargon are called "entities", and
13 the reason for the three slides and the reason for the
14 list is to give the Board a perception of what is the
15 complexity to have an efficient management information
16 system that prescribes this particular set of
17 functions.

18 Each of those fifty items have got to be
19 defined, understood and applied in a consistent fashion
20 if STEMS is going to end up doing what it's supposed to
21 do, and that's have a consistent way of describing
22 "what have I got?"; "what can I do?"; "what might I
23 do?"; "what did I do?" and "what was the result?"

24 So that list - I'm not intentionally
25 going through the list - but there is an array of items

1 that have to be well-defined and well understood. And
2 so for people who turn around and say, well, this is
3 rather a simple thing, why didn't you just go and sort
4 of measure what the hell happened and then describe it?
5 With no apology, it is a little bit more complex than
6 that.

7 Slide 29 describes the nine major pieces
8 that STEMS will be made up of, the nine basic what are
9 called "applications" within the whole STEMS
10 environment. And I want to go into a little bit more
11 detail into items five and six on that list in slide
12 29, the items dealing with effectiveness monitoring per
13 se and the surveys and reporting. And before I get
14 that far, that list on slide 29 embraces this whole
15 environment of what STEMS will speak to. The idea of
16 definitions and standards; this idea of prescriptions,
17 treatment recording data collection.

18 So there, on slide 29, is the list of
19 what is really embraced in the whole of STEMS as a
20 system.

21 But if we turn to slide 30, and we'll go
22 a lit bit more explicitly and spend a little bit more
23 time on what STEMS is envisaging effectiveness
24 monitoring with respect to silvicultural will be about.
25 And a rather gentle reminder at the top of the page as

1 to what is effectiveness monitoring trying to
2 ascertain, we need to answer "what was the objective?",
3 "was it achieved?", and more relevantly, "how well did
4 we do?" And very simplistically, this is what we
5 understand effectiveness to be about.

6 In the eleven items listed in slide 30,
7 any one of those eleven in itself is a possible measure
8 of effectiveness monitoring. And as STEMS develops,
9 each and every one of those will get defined in detail
10 as to exactly what data, what timing, what process
11 would be used to measure that effectiveness.

12 For example, if we go through to No. 7 on
13 that list in slide 30, "compare treatment targets with
14 results." I planted 100 trees and 110 of them lived.
15 I didn't do at all well because 90 of the 110 came from
16 "H".

17 That sort of information is the sort of
18 information that may well be in item 7. It is
19 something that the Board has heard about before, and
20 any single one of those have some measures of
21 effectiveness.

22 The time horizons for those measures
23 varies. It may well be within a year: "What did I do
24 and how well did I do it?"; to within ten years: "What
25 did I plan to do and what did I actually get?"; to

1 maybe over a complete rotation eighty or ninety years:
2 "What did I plan to do and what did I get?"

3 Now, at this particular time in STEMS
4 there is no detailed answer to any of those eleven.
5 There is no finite, complete list of exactly what
6 measures and how will it be done. All I'm telling you
7 is that's exactly what will be done as STEMS unravels
8 and is put into place.

9 Slide 31 deals with another of the major
10 of the nine business functions within STEMS and deals
11 essentially with the reporting concepts at this point
12 in time envisaged.

13 The idea of producing provincial
14 treatment surveys. For example, the idea of producing
15 an overall provincial aggregation or summary of free to
16 grow results, as an example.

17 Items 3 and 4 speak to pieces of
18 information that you've already heard back in Panel 16,
19 if I remember correctly. So STEMS has that sort of
20 functionality or will have that functionality built
21 into it.

22 The last slide in STEMS, slide 32, sort
23 of summarizes the major pieces that is envisaged within
24 STEMS. It will contain a library of standards and
25 guidelines, its electronic version of the silvicultural

1 guides, the silvicultural ground rules. If you like,
2 the place that the manager or the planner or the
3 forester will turn to for "what can I do?", "what
4 should I do?", "what have I got?", "what are my
5 options?"

6 The second main message in there is this
7 ability to be able to compare the results of what are
8 actually achieved with the prescription and the result
9 of what I got with the treatment, recognizing that the
10 prescription and treatment may well be different.

11 There is a serious concern within STEMS
12 about having a design for having accessible data. This
13 in itself is a real challenge. We're trying to
14 ascertain who and how that accessibility will be made
15 possible. And there will be an ongoing discussion with
16 an array of users as to exactly what that means.

17 In this day and age in computers, that in
18 some ways is simple, in some ways it's quite
19 complicated.

20 Likewise in item 4 there's the need for
21 ensuring that STEMS doesn't work in isolation, it fits
22 in conjunction with other information systems. And I
23 mentioned earlier the example of a piece out of STEMS,
24 like free to grow, will well be used to augment and
25 enhance the inventory.

1 The last overall message to do with STEMS
2 is because STEMS will take a period of time to become
3 operational, there's a recognition and intent within
4 MNR to continue with the province-wide silviculture
5 information system as a means of recording what have we
6 done and what was the result in silviculture?

7 MR. FREIDIN: Q. Dr. Osborn, what would
8 your response be to someone who suggested that they
9 were interested in particular in silvicultural
10 effectiveness, amongst all the other matters, and they
11 said: Why don't you just fast track STEMS and then
12 deal with the other matters once you've completed that
13 task?

14 DR. OSBORN: A. There's two facets to
15 the answer of that question.

16 If we were to fast track STEMS or make
17 STEMS a higher, top priority within MNR, some of the
18 other information management systems currently on the
19 books - and there was a slide, back in the front end of
20 the INRIS story - some of those other systems would
21 either be slowed or to use a cliché "fall off the
22 table." MNR would have to rethink its priorities.

23 That's not to say that can't be done. It
24 would require a little bit of investigation as to what
25 would be the implication if we were to stop or slow

1 down the work going on in the enforcement system or the
2 system to do with integrated finance with
3 administration.

4 So there are some management implications
5 of having such a suggestion.

6 The other facet of the answer, in a way,
7 is at this point in time the design from STEMS and the
8 perceived requirements by the users of that system feel
9 that unless it incorporates some and maybe a lot of
10 geographic information systems technology, it will not
11 be able to deliver some of the things the users want.
12 You won't be able to use it to do things you need to
13 do.

14 And if it goes that particular direction
15 and uses that technology, as will be explained some
16 time later this afternoon, that requires sets of data
17 that at this point in time aren't digitized across the
18 province and the overall plan is not to have those
19 digitized until at least 2004 or 2005.

20 So there are some data implications in
21 trying to fast track STEMS. And those are two
22 immediate facets that come to mind if you're trying to
23 fast track it.

24 Q. Thank you.

25 A. A quick change of pace. If I can

1 briefly describe what STEMS was about.

2 There's a couple of slides that describe
3 what the timber management planning information system
4 is; and this system is still very much in the
5 feasibility study phase, but we thought it important to
6 share with the Board, particularly as there's a quite
7 tight intimacy, if you like, between TMPIS, STEMS and
8 inventory. In fact, it's hard when you do these
9 studies to ascertain where one stops and the other
10 starts. And with all respect, the user probably
11 couldn't care less because it's supposed to be
12 transparent to them anyways.

13 TMPIS at the moment has the idea of
14 having the field with a standard set of tools to manage
15 and maintain the information needed in TMP. At the
16 moment within MNR there is an array of tools, a
17 different set of tools in different parts of the
18 province, and this is leading to inconsistencies. So
19 there's a technical idea in TMP of "for heaven's sake
20 let's all use the same computer system" type of
21 approach.

22 There is also the need for the data
23 within the timber management planning particularly to
24 be produced and arranged and kept up-to-date in a
25 consistent fashion, as is needed in leading into the

1 analysis part and the decision-making part in the
2 timber management planning process.

3 The Board has been exposed to the idea of
4 models in timber management planning. It's essential
5 that the data that feed into those be in a consistent
6 fashion. You cannot have the same sort of model being
7 used across the board if the data aren't organized in
8 the same way. That also is needed to be improved in
9 the systems sense.

10 The third item, third objective, in TMP
11 which is very unique to TMP, per se, is this idea of
12 tracking and seeing the status of certain issues that
13 arrived during the timber management planning process;
14 to know where those issues are, what's been done about
15 those issues, the status of resolution of those issues.

16 The fourth objective deals with a
17 relatively simplistic idea, and that's the ability to
18 amalgamate and aggregate and roll up data from
19 individual timber management plans into district,
20 regional, provincial summations.

21 So we're talking of the ability to
22 report, let's say provincially, "what is the provincial
23 MAD?" - maximum allowable depletion for the province.

24 And the last item that's in the TMP's
25 objectives again relates to something the Board has had

1 explanations about, and the idea that they have the
2 ability to roll up some of the data and some of the
3 assumptions and/or commitments in timber management
4 planning of strategic planning for timber management
5 supply, let's say in something like the timber
6 production policy.

7 So, in a way, what's in TMPIS is really a
8 more consistent set of procedures to make life both
9 easier and more consistent to the array of users for
10 that information.

11 Q. Dr. Osborn, if I can just go back to
12 STEMS for a moment, could you turn to page 13 of the
13 witness statement?

14 And on page 13 we have a discussion of
15 recording and recording silvicultural effectiveness, and
16 there's a description starting in the third paragraph
17 of some of the problems with SIS which have, in fact,
18 been part of the motivation for the development of
19 STEMS.

20 Do you see that little indentation there,
21 the number of problems? Would you advise whether, in
22 fact, any of those problems are going to be addressed
23 in any way sort of in the interim? And by the
24 "interim" I mean before before the STEMS program was
25 fully developed and implemented.

1 A. The first of the, of the four items
2 to some extent has disappeared within MNR in that now
3 with the, I'd say "proliferation" of computers and
4 software in district offices, personal computers, the
5 ability to do assessment and record assessment results
6 has now become that much easier, that far fewer people
7 now use the system of SAS that was described on page
8 13.

9 And to that, and given that the
10 silvicultural exists -- information system has a
11 capability of recording the result of that assessment,
12 that problem between that linkage, in a way, has
13 disappeared or been minimized.

14 Similarly, that speaks to the second of
15 those two items. Technology, in a way, has partially
16 overtaken the dilemma, to give a simple answer to that.

17 The third item, the unavailability of
18 historical data, this is a criticism of SIS in an
19 across-the-board sense. However, within the existing
20 silvicultural information system, there is the
21 provision for having some part of historical data
22 available as a matter of the level of detail.

23 There at the moment, as far as I'm aware,
24 aren't specific plans in SIS for the next two or three
25 years to speak to that in detail, with one caveat. As

1 STEMS is designed and developed, there is perceived to
2 be and planned to be a large workload under the STEMS
3 umbrella of entering historical data.

4 Now, given that goes on, SIS has the
5 availability of being able to look at and use those
6 data the same as they would be within STEMS, so over
7 time that situation with the unavailability of
8 historical data will be reduced.

9 I'm a little cautious because there's
10 some technologies involved in that process.

11 The last item, given the design and of
12 the way the existing silvicultural information system
13 at the moment, it would not be easy to add new and
14 emerging information needs with the existing SIS. In
15 fact, there was some discussion in looking at STEMS as
16 to whether or not there should be a, if you like, a new
17 and improved tabular version to overcome these sorts of
18 shortcomings, and the general feeling was, "let's not
19 do another two- or three-year interim solution; let's
20 do it right, let's do it properly; and let's wrestle
21 with existing SIS over the next five years as best we
22 can."

23 So only partially would we speak to the
24 first four items on page 13.

25 Q. Thank you.

1 I believe that's the end of this portion
2 of evidence, Dr. Osborn?

3 A. There was one slide, slide No. 34,
4 that essentially wraps off the scene as far as TMPIS is
5 concerned and given that TMPIS does achieve the
6 objectives it set out in slide 33, these are the
7 intents, these are benefits that will be perceived by
8 having that more consistent system in place.

9 Literally the availability of more
10 information - this is one of the driving forces behind
11 TMPIS, the idea of having that available electronic
12 format; and given its electronic consistent format,
13 that should make it easier to satisfy public requests.

14 And the fourth item deals with the need
15 to be able to describe the scheduling and the status in
16 a more automated fashion.

17 MADAM CHAIR: Dr. Osborn, many times
18 we've heard over the years that if the public wanted
19 more information, they would have to present themselves
20 at the district office in order to find the information
21 they wanted, that there has always been a difficulty
22 packaging very large files of information into
23 something the public can use; and obviously this has
24 been a complaint of the interveners at the hearing,
25 that they don't want to have to go to the district

1 office, that they want to get their hands on whatever
2 it is they want in other ways.

3 And do you see this as answering that
4 request?

5 DR. OSBORN: The quick answer is "yes."

6 The caveats with that are that for what I
7 will call "tabular numerical type data", that won't
8 necessarily be very difficult or very complex in this
9 day and age. So finding out the numbers or the words
10 of something, its quite easy to transmit and store
11 electronically and make available electronically.

12 The reason for my hesitancy is the sort
13 of request that will come where the map is the form and
14 format that the requester is used to or looking for.
15 And that causes me to hesitate in two ways.

16 One, it will take a period of time before
17 all that information is available on that electronic
18 form, that's the maps would be in electronic form, all
19 those data are digitized, and that will take some time.

20 The second part, it also presupposes the
21 requester has the technology to both receive and use
22 information in that form.

23 So whereas if I go to the district office
24 and I receive a hard copy map, the technology for
25 interpreting and understanding what that map means is

1 in my head. If you ask for it and receive it in
2 electronic form, it presupposes you have the tools and
3 technology and understanding to analyze that map in its
4 electronic form.

5 So, yes, over time that will come, Madam
6 Chairman. It will be easier for some pieces of
7 information than it will be with others.

8 MS. BLASTORAH: We're moving next, Madam
9 Chair, to the evidence of Mr. Uhlig, and I'd like to
10 mark another exhibit in relation to that -- I'm sorry,
11 first we're going to -- no, that's right we're going to
12 Mr. Uhlig next. And the next exhibit will be a package
13 of overheads entitled: Information Collection and
14 Management Forest Ecosystem Classification Ecological
15 Land Classification, and that package contains 23
16 pages.

17 And I'd also like to point to some
18 additional pieces of material behind Mr. Uhlig that are
19 displayed. It is not our intent to mark these as
20 exhibits, they're for illustrative purposes only and we
21 do have some problem in that these are on loan, some of
22 them actually from Mr. Racey, and they are not ours to
23 keep or give away, as a consequence it's a little
24 difficult. We don't think that it's necessary to mark
25 them as they were only going to be used to to

1 illustrate concept that Mr. Uhlig is going to be
2 explaining verbally. The landsat image on the left
3 which is indicated as item A is similar to landsat
4 images that were marked during the evidence of Mr.
5 Armson early on in the hearing.

6 There are similar types of information
7 consequently in the exhibits list on the record; and I
8 would point out that is the same kind of information if
9 someone were interested in viewing the type of image
10 that he was looking at, I think they could see that and
11 have the context in which his comments were made. We
12 have lettered the items so that they can be referred to
13 easily.

14 Item B is an aerial photograph. Again,
15 that type of material has previously been used in the
16 hearing and is on the record. It is the sort of the --
17 the nature of the individual aerial photograph isn't
18 particularly relevant, it's just to explain a concept,
19 and this one is at a large -- is blown up enough so
20 that it's easily viewable from anywhere in the room.

21 Items C, D and E are simply photographs
22 of various scales of landscape. Again, the specifics
23 of the individual photographs is not particularly
24 important, it's more to illustrate the concept of
25 scale. So I would ask that we be allowed to use those

1 as demonstrative aids rather than marking them a
2 exhibits.

3 MADAM CHAIR: Any objections?

4 We will go ahead with that Ms. Blastorah.
5 Mr. Uhlig's overheads will be Exhibit 2284.

6 ---EXHIBIT NO. 2284: 23-page overhead entitled:
7 Information Collection and
8 Management Forest Ecosystem
Classification Ecological Land
Classification.

9 MS. BLASTORAH: Thank you.

10 Q. Whenever you're ready, Mr. Uhlig?

11 MR. UHLIG: A. Thank you, Ms. Blastorah,
12 Madam Chair.

13 The topic I've been asked to address
14 today is that of the forest ecosystem classification
15 program and the ecological land classification, and
16 I've been asked to provide a brief background on the
17 province's activity in fundamental areas of providing
18 an ecosystem fabric, if you will, for management
19 purposes.

20 Q. Mr. Uhlig, I'm sorry to interrupt you
21 right off the bat, but I think because you're sitting
22 back from your microphone we may have a little
23 difficulty hearing you. I know that you've had a
24 throat ailment and it may be difficult for you to speak
25 up, but I would ask you to attempt to do that, and to

1 slow down just slightly for the court reporter.

2 Thank you. And I'm advised that you have
3 a tendency to drop your voice at the end of your
4 sentences sometimes. So now the critique is done you
5 may continue. (laughter)

6 A. Anything else?

7 Q. Thank you.

8 A. No, I'll try and speak up a little
9 bit. I hope my voice will take it.

10 I've organized my talk into three
11 sections.

12 Firstly, I'd like to review concepts,
13 primarily what ecosystem classification involves and in
14 part how we proceed with that type of work.

15 Secondly I'd like to review the work
16 which we performed to date, looking a little bit more
17 closely at how we've done that work, what the products
18 can do and in part what the products can't do.

19 And, thirdly, I'd like to present some of
20 the current work and some of the work that we've
21 proposed for the near future.

22 Now, I understand that the Board has
23 heard some material regarding ecosystems, ecosystems
24 structure and a variety of that material. I ask the
25 Board's indulgence, I would like to review some of the

1 concepts. I think it would be beneficial if we were
2 all starting with a clear set of terms in our head.
3 This type of work tends to be rather rich in jargon,
4 I'll try and avoid it if possible.

5 One of the things which we have to
6 consider at the very beginning is that ecosystems have
7 no inherent dimension, or we could turn that around and
8 say we oppose a dimension on the particular system.
9 And it's based in part on our particular focus on the
10 structure or organizational features, functions or
11 interactions which we consider to be important for a
12 particular management or conservation goal.

13 We often give ecosystem boundaries in
14 practice at small scales, and here I'm using the
15 standard geographic definition. "Small scale" means
16 large area of very little detail, like the paragraph of
17 the image on the right here. (indicating)

18 Q. And you're referring to a...

19 A. The landsat image--

20 Q. --marked as A.

21 A. --marked as A.

22 And at that level we often look at broad
23 vegetation zones, very broad distributions of major
24 tree species, shrubs, whatever. You're looking at a
25 very, very broad scale pattern, or distribution

1 patterns of macro scale landforms, surficial materials
2 and water bodies also evident in imaging.

3 At larger scales, which is smaller areas
4 in much greater detail, like the images C, D and E
5 where you're looking at smaller pieces of ground, you
6 have greater resolution, greater detail. We are often
7 looking at distribution patterns that have individual
8 occurrences of plant communities land or analogous to
9 an FRI stand or distribution patterns of soil, soil
10 types or smaller landform use.

11 Some processes or questions are only
12 appropriately asked at certain scales.

13 This next overhead, overhead No. 3 in the
14 package, just walks us through a series of scales from
15 very small to very large and is looking at an example
16 process which might be relevant at that particular
17 level of ecosystem organization. And they're organized
18 here in a hierarchical fashion from global to a
19 component that you might find within a single stand of
20 trees that have fallen off at the bottom of the scale.

21 You'll notice down the right hand of the
22 diagram that the process is included at the very small,
23 the global level might be something like ozone or cloud
24 CO2 concentrations in the atmosphere, climate change.

25 At a regional level, much like the image

1 in A, we might be looking at patterns of species
2 migration or broad patterns of disturbance like the
3 fires which were indicated there or storm tracks or
4 patterns of harvest or patterns of disturbance caused,
5 perhaps, by insect epidemics.

6 As we move down in scale to perhaps a
7 hundred square metres or so -- or a hundred square
8 kilometres to some of the middle scale landscapes,
9 again we might be looking at patterns of disturbance,
10 like epidemics or fires.

11 As we move down to a forest level
12 something akin to what you might see in image B, a
13 particular managed area of forest we might be concerned
14 there with patterns of soil nutrient pools, organic
15 manner, disturbances caused by roads or whatever
16 variety of things that happen at that level of
17 organization.

18 As we move down to a stand level of
19 perhaps a hundred square metres or a few hundred square
20 metres as shown in part in image C or more
21 appropriately in photograph D, we might there be
22 concerned with patterns of Canada gas. Actually stand
23 structural features and what they might be doing to
24 patterns of the stand generation or productivity.

25 And, finally, we might for some purposes

1 be interested in very, in very detailed phenomena with
2 a particular stand; an element or special feature
3 within a stand, like the standing dead tree in
4 photograph E. And there we're going to be concerned
5 with actually patterns of the composition. We would
6 not study the composition, for example, at the scale of
7 the landscape, the large landscape in image A. It
8 would be relevant to take measurements at the scale of
9 D or E and perhaps summarize them, but you would not be
10 studying them at the scale of image A.

11 This next slide, slide 4, tries to
12 capture that meaning again or hierachical organization.
13 We often have to look at ecosystems of more than one
14 scale simultaneously, more than one spatial scale, that
15 is. We often have to observe ecosystem phenomena at a
16 regional scale and then again at a local scale, where
17 we're concerned with more detail. Perhaps
18 manipulations within a given set of the standards for a
19 wildlife purpose.

20 The other scale that we have to be
21 cognizant of, however, is the temporal scale. The
22 forests are not static, they vary across the landscape,
23 they also vary through time.

24 What we're usually concerned with is the
25 relationships between various ecosystem components for

1 values and their pattern occurrence through both space
2 and time, and traditionally how we've approached this
3 is through some exercise of land evaluation or
4 classification and this goes back all the way to
5 antiquity, and we have all kinds of concepts for
6 fertility and non -- and less localized fertile lands -
7 the agricultural examples are probably oldest and
8 best - and most of our classifications are based --
9 well, they all are based on human perceptions and
10 values. We place a value on a particular phenomena
11 that we might wish to optimize or minimize on the
12 landscape.

13 More recently, however, we started to
14 approach the question in a more holistic manner through
15 comprehensive ecosystem classifications.

16 Can you put that back, please? Thank
17 you. Sorry. I just got one ahead of it.
18 ---Overhead changed on screen.

19 MR. UHLIG: Overhead 5 is simply
20 addressing the definition of what a site or ecosystem
21 classification is, and it is a method to organize and
22 communicate knowledge about either the physical or
23 biotic features of, in this case, forest land, as well
24 as forest land response to management practice. So we
25 want to know what we have of -- what are phenomena

1 that we have to deal with, and in part we might wish to
2 look at how it responds if you push it in a pertinent,
3 certain direction.

4 We use classifications as a framework to
5 model, to reduce the complexity inherent in ecosystems,
6 spatial and temporal, and to express the relationships
7 between these physical and/or biotic features of forest
8 lands. We're trying to get at the underlying
9 relationships that are driving or organizing the
10 ecosystems in a certain pattern.

11 And we use those as tools to stratify and
12 apply management prescription to actual forestland
13 areas. So organization, a framework or a conceptual
14 model and then as a tool to stratify and organize our
15 approach to land management.

16 We view this as needed work primarily to
17 increase our ecological understanding of the forestland
18 resource and to use this knowledge as a basis for
19 prediction. We need consistent guides, if you will,
20 for the management of the forest estate spatially and
21 temporally, and we need to have a holistic
22 understanding of what's going on here so that we can
23 balance the various resource demands and provide for a
24 substantive supply of different values.

25 Perhaps most important, and this is a

1 personal bias, I see classification work of this type
2 as the key tools is one of language. The ability to
3 consistently describe ecosystem features, use it as a
4 training mechanism, use it as a reporting mechanism and
5 use it as a data collection mechanism for other
6 programs, such as growth and yield. We often describe
7 the landscape very, very differently. One person's
8 expertise teaches them certain things, and another
9 person's expertise teaches them something quite
10 different. So the use of these classifications as a
11 consistent information storage and information
12 collection tool is critical.

13 Classifications also have limitations.
14 Classifications are designed for a given set of
15 purposes. They are not all seeing, all knowing things.
16 We can't design anything like that. We have to be very
17 cognizant at the outset of our work that we design
18 classifications to achieve certain goals, and that
19 makes them very good at some things and not very good
20 at others. And FRI would be the example that we might
21 bring out other classifications that are designed for
22 certain purposes. It does deliver those things very
23 well and is often misapplied, depending on people's
24 interests.

25 Classifications are based on present

1 knowledge. You tend to accumulate, store, organize and
2 present what we already know or can collect fairly
3 easily about ecosystems organizations and, and the
4 functions inherent in them.

5 And the last point might be a little bit
6 obscure, but classifications do not test relationships.
7 They organize them and set up the questions that we
8 might begin to go and address questions such as "how
9 productive is this land?" or "how useful is it for
10 moose habitat?" But we tend to package in
11 classifications the type of information that would
12 allow us to proceed with that kind of study. They are
13 not designed to answer all of those questions; getting
14 back to the idea of organization and stratification as
15 opposed to analysis.

16 I mentioned earlier that there is a
17 hierarchical organization ecosystems, there have also
18 been a variety of observations that ecosystems are
19 organized systematically. We've, we've used that
20 observation to develop a process, if you will, for
21 dividing the landscape at different scales, collecting
22 information and trying to package this in terms of
23 classification and overhead No. 8 looks at the
24 classification process in fairly simple terms.

25 We usually define a universe, in this

1 case I'll cite the province. We could look at
2 continental or hemispheric scales if you wish, but
3 let's confine ourselves to the province.

4 The next item we tend to look at are
5 macro climatic phenomena, broad regional patterns,
6 weather patterns, which define broad environmental
7 domains, and the example given there are some of the
8 site regions that Phillips (phoen) developed in the
9 1950s and '60s.

10 Below that level we begin to look at
11 fiscal features in the landscape - physiography or
12 landform; below that we might also look at aspect,
13 scale type; and then building on that information plus
14 vegetation and other features we would then develop a
15 population of types of community types, soil types or
16 vegetation types, which would be our ecosystems of
17 interest at the largest scale.

18 And I'm using the term "aspect" to
19 describe a position of slope -- position on a slope and
20 the direction the slope is facing, north, south, east,
21 west - that kind of thing.

22 An example of the regional level of
23 ecosystem hierarchy that we have in the province is the
24 work of Angus Hills developed in the late '50s and '60s
25 as these are the ecological regions developed by Hills.

1 The boundaries here represent the vertical lines from
2 east to west; the hatched (sic) line on the far western
3 side of the province, the one that cuts the province
4 roughly in half; and then the other hatched line that
5 runs through Quebec are gradients of humidity, so they
6 represent patterns of season precipitation.

7 The north/south lines tend to be lines of
8 decreasing, as you go north decreasing mean annual
9 temperature, so what Hills has provided here is a set
10 of environmental domains within which ecosystems could
11 be expected to develop and function within certain,
12 certain limits.

13 Hills also went on to define, to
14 subdivide these regions into a set of districts. I
15 realize the boundaries in this particular overhead, No.
16 10, are somewhat hazy on the overhead. Perhaps you can
17 consult the material in front of you.

18 These districts now look a little more
19 precisely at local variations in landform and soil type
20 to try and break out more local variation. And I'll
21 draw your attention to side region 3E on the eastern
22 side of that particular diagram. Site district 3 which
23 corresponds to the claybelt. I believe the Board has
24 visited the claybelt area and is probably familiar with
25 the unique landform and soil conditions that you find

1 there. That is the type of resolution that's provided
2 at an ecological district level. There is a unique
3 flat or flatter landscapes, very typical clay or peat
4 soils, a unique local climate related to the low
5 topography and its position latitudinally in the
6 province and very specific forest types which occur
7 that are dominated by black spruce peat lands and a
8 variety of other types, and, hence, a very specific
9 pattern of resource use and resource allocation in the
10 area; particular patterns of forest management,
11 particular patterns of wildlife polulations. So it's
12 at that district level that we start to see some of the
13 local patterns start to emerge.

14 There are a variety of levels below the
15 ecological districts and regions. Some of the
16 terminology the Board may have heard includes things
17 like "ecosections" or "land types", "ecosites" and
18 "ecoelement", and I'll just refer briefly to the
19 diagrams in front of me. I unfortunately couldn't
20 develop something that was relevant of an ecosection.

21 The image letter A would portray enough
22 of the province in northwestern Ontario - and I'll just
23 stand up. Can everybody hear me if I just stand up and
24 yell?

25 This is northwestern Ontario, Sioux

1 Lookout is in the bottom right hand corner here
2 (indicating), Dryden would be just off of the bottom,
3 Red Lake would be just off the northwest corner.

4 I believe the Board has visited at least
5 a portion of this area so you're probably familiar.

6 At this level we see portions of a couple
7 of ecoregions and within here we might have a couple of
8 areas which have unique district patterns, unique
9 ecological district patterns. That's what this image
10 is trying to capture, that type of scale.

11 Unfortunately we didn't have one that provided a
12 large -- a broad area view of ecosections, but in this
13 area ecosections which are roughly analogous to a land
14 type, a mapable land entity that you would try and put
15 on a map are captured here where we have consistent -
16 sorry, you can't hear me, right? Can you still hear
17 me? All right. - consistent recurring patterns, the
18 combinations of soils, landform and then vegetation
19 which might occur. So you have recurring patterns of
20 wetlands, you have recurring patterns of upland forests
21 and their associated soils. Those would be examples of
22 ecosections, although this one would only have three or
23 four on this particular example.

24 This image C, again, show some of those
25 same patterns, but we're focusing it on a much smaller

1 part of the ground. This would be representative of
2 the ecosite level, we have individual stand types with
3 the corresponding soil conditions, of course,
4 underneath which might be of relevance to silviculture
5 or a habitat interpretation.

6 So in that level we move down to ecosite
7 or ecoelement where we're looking at an individual
8 community, a vegetation community, or components within
9 that stand such as an ecoelement of interest now,
10 standing dead, woody material which might have a
11 particular habitat value for cavity nesting birds. So
12 the ecoelement level will be right down to individual
13 within stand features.

14 MS. BLASTORAH: Q. Mr. Uhlig, you
15 indicated in relation to item B behind you, did I
16 understand you that there would be a number of
17 ecosections which you term "ecosections" on that image?

18 MR. UHLIG: A. Yes, there could be,
19 depending on how you define them and what your scale of
20 interest was, for example.

21 Q. And I believe you indicated that
22 ecosections would be mapable entities; is that --

23 A. Yes, they would be.

24 Q. Are they currently mapped?

25 A. At the -- using the definition that

1 we currently use, which is drawn from the Federal
2 Canadian Community of Ecological Land Classification
3 Publications - and I'll put this overhead up in a
4 moment, but I'll go through the definition first.

5 An ecosystem is a holistic unit and which
6 is of -- comprised of recurring patterns of terrain,
7 plus soils, plus vegetation and the surrounding water
8 bodies and fauna, so it's a holistic entity.

9 As defined in that way, we do not have
10 ecosections mapped. We have in the province some
11 components of that map. We have what are -- perhaps
12 the Board is familiar with the Ontario Land Inventory,
13 however those mapped units portrayed on those maps are
14 only soil and physiographic entities, they do not
15 contain any vegetation information and certainly no
16 direct faunal information. None of these layers are
17 mapped or contained within the ecosection definition.

18 Q. And am I correct that without the
19 addition of those other layers, the use of the Ontario
20 Land Inventory would be limited?

21 A. Yes, it would, because in order to
22 regain that understanding of the whole ecosystem, we
23 would have to build up those information layers and
24 faunal information back in.

25 I might refer back to some of the

1 information that John, Dr. Osborn, just went through
2 which described thematic layers which INRIS is trying
3 to capture in its efforts to develop a derived FEC
4 mapping system. And he outlined the topographic
5 element, the climatic element, the soil element and
6 then the vegetation element. You need all of those to
7 properly described wildlife habitat, for example, or
8 something that might have of interest to forest
9 management.

10 Q. And one last question before we leave
11 this topic. You've indicated that ecosections are not
12 yet mapped; do you have any idea of how many
13 ecosections, just to assist the Board in understanding,
14 how many ecosystems would probably be found within, for
15 example, a forest management unit?

16 A. Well, the, the way I'll answer your
17 question is by saying that, start at the top of the
18 hierarchy. If you use the federal system of ecological
19 regions, we have seventeen ecological regions in the
20 province. We have 79 ecological districts using the
21 federal system and within which you might have, if you
22 ordered a hundred or more recurring ecosection types,
23 so on -- you're now up to perhaps hundreds if not
24 thousands of ecosections in the province.

25 Within ecosections, then, you might have

1 a wide variety of local ecosystem types, ecosites or
2 ecoelements, the individual community types, some of
3 which would be unique to parts of the province. You
4 would then definitely be up into the hundreds of
5 ecosystem types for the province.

6 Q. And just to make sure we're clear,
7 then, in terms of the ecosection level, can you -- when
8 you said there would be hundreds, were you referring to
9 the ecosection element within a management unit?

10 A. Yes. There would still be -- you
11 mentioned ecodistricts within a forest management unit
12 which is typically somewhat smaller and an ecological
13 district, there would still be hundreds of recurring
14 ecosections within that.

15 Q. Thank you.

16 A. The final concept I'd like to take a
17 quick look at is the link between classification and
18 mapping.

19 Classifications are organizational
20 systems. What you're trying to do is populate your
21 populated ecosystem fabric with types, and you usually
22 have those reported in field guides - some of which I
23 understand have been presented to the Board as evidence
24 from the different forest ecosystem classifications -
25 and they're used as an onsite tool for assessing the

1 immediate area of interest and they cannot be used
2 informally for, for describing and, and recording
3 information on a site.

4 However, for most of our planning
5 applications, we have to have more explicit knowledge
6 about where exactly these ecosystems are and how much
7 of each of them we have, and to capture that
8 information we usually need some type of mapping system
9 or mapping -- or mapping systems to be in place; and
10 these can be informal ground mapping systems all the
11 way up to very extensive and complex corporate mapping
12 systems for a variety of purposes.

13 Overhead 12 summarizes the relationship
14 a little bit more. The classification is simply the
15 population of the types that you have in a given area,
16 and it's used as an allocation tool - and I'm using the
17 word "allocation" here as an identification - and then
18 you can allocate it to a class of creatures or of
19 ecosystems, so you use it as an identification tool.
20 And related to that -- that class, might be some
21 description of characteristics.

22 Following that, you would then through
23 either ground sampling or some application of remote
24 sensing of ground sampling develop a pictorial display
25 of where those ecosystems are in a given area of land,

1 which is then your map. And all the map is, is a
2 picture of your classification for a given area.

3 That concludes the first part of my talk
4 regarding some background concepts. Thank you for
5 bearing with me for going over them.

6 What I'd like to go through now are some
7 of the activities that we have been involved in
8 specifically over the past, I guess, 12 years or so
9 related to the forest ecosystem classification program.

10 Now, our work to date in this area has
11 been comprised of three major programs, and these were
12 all field derived. They were field requested programs
13 from MNR staff and the forest ecosystem --
14 ---Reporter appeals.

15 MR. UHLIG: These systems were oriented
16 to silvicultural information collection and the
17 classifications were designed do assist in
18 silvicultural decisions on precut mature forestlands.

19 They were designed to be a holistic
20 descriptions of what's out there, soils, plus
21 vegetation, and their key deliverable was this
22 consistent language for training and for planning.

23 MS. BLASTORAH: Q. And, Mr. Uhlig, just
24 so we make sure that we caught all of your remarks, I
25 don't think you repeated them exactly, did you indicate

1 that these systems were field requested?

2 MR. UHLIG: A. Yes. In each case the
3 local specialists and, and field practitioners,
4 foresters and to some extent the wildlife habitat
5 biologists said: We need some tools to help us with our
6 description of the lands base and to help us in making
7 management decisions. So in each case they were a
8 grass roots type of effort which then garnered some
9 resources and then proceeded with the program.

10 Q. Thank you.

11 A. I think it's about three programs of
12 interest here from 1979 to 1983, claybelt FEC by Jones
13 et al was performed; 1984 to 1990 there were two
14 concurrent programs, one for the northwestern part of
15 the province and one which addressed the red and white
16 pine ecosystems of the Algonquin area, Algonquin
17 region.

18 It's important to know at this point
19 the -- that even with the limited purposes outlined,
20 the silvicultural orientation and their mature forest
21 area of interest, these projects all involved four to
22 six and a half years to complete an individual project,
23 and that's just for the classification, not the
24 associate interpretations or any experimental mapping
25 programs that might have been associated with them.

1 As an example, the northwestern Ontario
2 FEC program had a dedicated team bearing four to twelve
3 people for that six-and-a-half-year period and was an
4 effort that involved approximately 200 -- \$2.2 million
5 for that particular classification. And I believe that
6 has been entered as an exhibit, that classification.

7 The interpretation programs for each of
8 these are still ongoing and led very strongly by the
9 regional technology development units as well as other
10 partners, and there has been some experimental mapping
11 to demonstrate the mapability of the systems for at
12 least the top two systmes, the Algonquin system has not
13 had any, any mapping province.

14 Q. And when you say "experimental", Mr.
15 Uhlig, what do you mean by that?

16 A. Experimental in the sense that small
17 study areas have been chosen usually 10 kilometres on a
18 side or less, of that order; where the small team went
19 out and exclusively tried to map the classification to
20 see if they could map it, and then portrayed those maps
21 as example products. These were not attempts to map at
22 district level or for an entire region to portray an
23 ecosystem fabric for a very large piece of ground.
24 They were always only for a demonstration of utility of
25 mapping. Technology development as opposed to

1 operational mapping program, perhaps that's the best
2 way to describe it.

3 There were some related activities in
4 different parts of the province. I mentioned the
5 interpretations development. There's been a long
6 ongoing training program and it's already been
7 mentioned that some hundreds of field practioners, MNR
8 staff have been trained as well as industry staff in
9 some cases, and there have been a variety of the
10 special purpose soil survey programs, different types
11 and different regions for the province, looking at some
12 larger scale and smaller scale portrayals of soils by
13 themselves for particular resource management
14 interpretations.

15 At the present time, these systems have
16 enjoyed pretty broad acceptance and have been
17 vigourously applied throughout the province. I
18 mentioned they have been a basis for the
19 interpretations development by the TDU's. They have
20 been used to greater and lesser extents by the research
21 community and the public, and while there has been
22 leadership by the forest program - it's sort of a
23 forest grown set of studies - there has been
24 recognition that there is a much larger user group and
25 certainly a much larger range of needs that needs to be

1 addressed by these systems.

2 Very quickly, the type of product that
3 the classification develops is this idea of a community
4 type or a vegetation type and here we see one of the,
5 what we call "operational groups", which is a summary
6 level type developed by the claybelt FEC, and it has a
7 particular combination of vegetation conditions. In
8 this case it's a mixed wood of hardwood and coniferous
9 species occurring quite regularly on a particular soil
10 type, and this particular fact sheet down the right
11 hand side of it, this gives you a brief description of
12 what the vegetation layer comprises in terms of tree
13 layer, shrub layer, the herbaceous vegetation and
14 mosses and then takes you through the ground surface
15 soil types and the physical parameters that you would
16 likely encounter in this type of ecosystem.

17 The other type of product or the
18 understanding that we develop from the classifications
19 is how these particular community types vary across the
20 landscape. And the next overhead, No. 16, gives a
21 pictorial representation of typical landform
22 topographic sequence of the community types that you
23 would encounter within the claybelt on course or
24 textured soils. And this is the type of information
25 that we have since used to develop our understanding

1 for full interpretation of these ecosystems and some
2 interpretations for habitat suitability or the -- or
3 use of the classification for different interpretations
4 based on aerial extent and juxtaposition of the
5 different community types.

6 There have been a wide variety of local
7 interpretations which have been developed, ranging from
8 different silvicultural applications, wildlife habitat,
9 forest productivity and I've already mentioned the
10 training program. I would like to draw some
11 distinction, though, however, between the
12 classification and then the values or evaluation and
13 interpretations which have been developed on.

14 There are some limitations, there are
15 some limitations which exist within the systems. They
16 are limited in their geographical range and they do not
17 have the province covered. There is a limited range of
18 ecosystems that are probably within that ecosystem
19 classifications.

20 They have focused on mature, uncut
21 forested conditions of importance to silviculture and
22 they are what I would refer to as "time static." If
23 they give you a snapshot of what's in the forest, what
24 is there now? There is no real interpretation of how
25 that ecosystem necessarily got there or what it might

1 do in the future.

2 The other limitation that we have is that
3 there are multiple classifications within the province,
4 and, therefore, multiple languages. And this is
5 something that we're trying to confront in our new
6 approach.

7 During the late '80s and into now the
8 year of the '90s, when the systems had been on the
9 ground for a while, people had a chance to review, use
10 and evaluate and a whole new set of user demands have
11 come forward. Some of these new demands are that we
12 refocus the classification to be more multiple use in
13 character so that they address explicitly wildlife and
14 other conservation priorities, in addition to the
15 silvicultural interpretations that are already
16 contained. There would be -- there have been requests
17 to be more explicit or more precise in terms of growth
18 and yield relationships on the various soil and within
19 the various community types identified.

20 Dr. Osborn has already outlined the
21 importance of this type of information to a system of
22 integrated natural resources inventories.

23 There is still the request that these
24 programs or these products assist in crop planning
25 silviculture, so we're not going to leave that behind.

1 We would look to rationalize the
2 different products that are out there, the different
3 ecosystem classifications that we have - the three that
4 I've mentioned as well as some of the soil survey
5 product that we have out there. And in a generic sense
6 there has been a request that these serve generic
7 environmental assessment approaches, land use planning,
8 a whole variety of communication conflict resolution
9 types of applications. And definitely the highest
10 priorities, that we have a more comprehensive
11 geographic coverage for the classifications.

12 What's evolved then is the third part of
13 my talk, and that's the current and future program.

14 Overhead 18 outlines what we're trying to
15 do, the evolution towards -- from our older forest
16 ecosystem classification program to the new ecological
17 land classification program, and in this what we're
18 trying to do is establish multi-user working group or
19 groups; rationalize our existing products; complete the
20 geographic coverage so that we have the full suite of
21 ecosystems types identified and methods available for
22 their description and interpretation; certainly widen
23 the ecological spectrum. And by this I mean let's
24 refocus away from simply the commercial silviculturally
25 important mature forest conditions to the wider range

1 of ecosystem conditions that we have out there -
2 wetlands; perhaps rare or not commercially important
3 forest systems; non-forest systems, such as very lichen
4 barrens on top of shallow bedrock systems, these sort
5 of things; and we would also like to endeavour to
6 improve our mapping approaches.

7 All of this will evolve towards a
8 provincial ecological land classification which
9 explicitly has complete ecosystem coverage for the
10 whole province, well outside the area of the
11 undertaking, but would also include Southern Ontario,
12 some sort of product for Southern Ontario and also for
13 the far north. And this is something that will likely
14 be a longer-term development, because of the
15 difficulties in working in those two areas.

16 We would like to improve the temporal
17 resolution, and by this I mean we would like to take
18 the classification out of their static approach and
19 begin to incorporate some understanding of successional
20 terms. How did that particular vegetation community
21 get there and what happens if it's disturbed in a
22 certain way, either naturally or by humans?

23 And as Dr. Osborn mentioned, we would
24 like to integrate this with related databases to
25 increase their utility for a variety of

1 interpretations.

2 Just so that there's no confusion, I'd
3 like to contrast the two programs FEC and ELC.

4 Forest ecosystem classification programs
5 are stand level. What they look at are entities like
6 in photograph B, you're looking at stand types
7 analogous to an FRI stand perhaps, but with a little
8 bit more detail. And there's no method for, as Dr.
9 Osborn mentioned, the rolling up in the landscape,
10 combining those recurring community types into
11 landscape units of some sort and then portraying them
12 higher up in the hierarchy.

13 I've already mentioned that we have
14 multiple products or classifications of languages that
15 are out there. They focus on mature, commercial
16 forests. They are limited in their ecosystem coverage,
17 there's no successional coverage and they have
18 primarily success -- primarily successional --
19 silvicultural orientation.

20 In contrast, the ecological land
21 classification program is multi-scale by definition.
22 We would be looking at large scale resolution of the
23 community type as well as developing rules for rolling
24 up the landscape into larger landscape units. We'd
25 like to provide a more consistent conceptual structure

1 and resolve some of the difficulties we have in the
2 language. Explicitly all ecosystems will be covered,
3 trying to get some successional resolution and from the
4 outset have it as a multiple use system.

5 Q. Just before you leave that slide, Mr.
6 Uhlig, when you indicated that the system would be
7 multi-scaled and that you could roll up, am I correct
8 that you mean by that that it would be hierarchical? I
9 think you used that term--

10 A. Yes.

11 Q. --at the beginning of your talk.

12 A. We would, we would explicitly address
13 the hierarchical nature of the ecocosystems and have
14 rules for which community types would be - would
15 comprise ecosites and which esosites could be rolled up
16 into which recurring land types or ecosections and then
17 which ecosystems can actually occur within each of the
18 environmental domains which are defined by ecodistricts
19 or ecoregions. We presently don't have that.

20 The ecosystems that we have within the
21 FECs are not bounded geographically at all or
22 environmentally at all. They could occur anywhere, we
23 don't have rules for determining which ecosystems are
24 equivalent or what is their likely domain within the
25 province.

1 Q. Thank you.

2 A. Overhead No. 21 is just pictorially
3 the relationship between the FEC and the ELC.

4 The ELC is not a new program, for
5 example, it's simply wider in scope. It's going to
6 build on the existing work and forest ecosystem
7 classification and broaden its ecological scope.

8 Approximately a year and a half ago we
9 began work on the ecological land classification
10 program under the sustainable forestry initiative, and
11 overhead No. 22 summarizes the items which were
12 included in that proposal and most of these are initial
13 program elements that we are proceeding on at the
14 present time.

15 We have seven program elements, these --
16 did you miss something? Overhead No. 22 summarizes the
17 program elements that we're now working on for the ELC
18 program, and there are seven. They include, one, a
19 strategic -- to development of a provincial strategic
20 plan, to rationalize our existing properties, the
21 individual FECs that we have, as well as proceed with
22 some of the other work. Rationalization would involve
23 resolving the differences in the different
24 classification languages, coming up with standardized
25 formats for prescription between the three ecosystem

1 classifications, and simply streamlining what is
2 presently somewhat of a cummmunication block in that we
3 have more than one language to describe individual
4 ecosystems.

5 The second program element is to develop
6 new technologies or, or improve some of the things we
7 already have in place for mapping and inventory these
8 methods. I do not mean by this that we will be mapping
9 the province, we will simply be developing the
10 technologies so that work of that type could proceed.

11 We will begin to look at the successional
12 trends, why these ecosystems occur as they do and how
13 they flow through time. We have already begun to
14 address the classification of wetlands explicitly as
15 ecosystem types to include as a, as the next module, if
16 you will, to attach to the forest ecosystem
17 classifications. And to accomplish most of these we
18 have been providing direct support to the regions for
19 data collection and system development.

20 The technology development units are now,
21 I guess, they're described as they're "science and
22 technology units" in the regions, are the main delivery
23 arm for this sort of work. They lead the program with
24 their expertise and their responsibility for the
25 development of regional and local products, and they

1 are leading the data collection and much of the
2 analysis which is going on for these individual
3 systems.

4 Item 6 refers to a data repository. Data
5 repository is simply a compilation of all this
6 information that we've collected. We're now
7 approaching close to 5,000 individual plots worth of
8 data which describe quite, quite a lot of detail,
9 individual vegetation characteristics, soils and
10 physical landform features. This data can be linked
11 explicitly to other data sets such as growth and yield
12 or particular habitat interpretations. So this is a
13 root database that we see as being of some utility for,
14 for further work in the future.

15 And there is an ongoing technology
16 transfer program with training courses and ecosystem
17 classification, mapping inventory, interpretations,
18 different approaches in applications for the
19 classifications in different regions; and those, that
20 program is led primarily by, again the TDUs in the
21 regions.

22 Q. And is it correct to assume, Mr.
23 Uhlig, that that training program may change as the
24 tool becomes increasingly sophisticated?

25 A. I would say "yes." It has evolved

1 substantially from the very basic soils training
2 courses that we taught eight to ten years ago.

3 They are now quite a lot more
4 sophisticated and address in some cases just the
5 techniques of classifying an ecosystem or identifying
6 vegetation; and there are higher level or upper tier
7 courses that deal with specific silvicultural
8 interpretations where it is assumed that you already
9 know how to classify things, and all the, all the
10 discussion and terminology is used, it is -- you just,
11 you simply couch in terms of classification and you
12 really are there to worry about, well, how good is this
13 area for moose or how good is this site in terms of
14 black spruce?

15 The final overhead I have are the
16 intended products which are, which we plan to have
17 completed by '95/'96 which is the end of the
18 sustainable forestry funding, and these include the
19 completed classification for forest ecosystems in the
20 area of the undertaking.

21 We would like to have a first
22 approximation of the wetlands classification, and by
23 "first approximation" I mean a first identification and
24 allocation of ecosystem types. These things must
25 evolve over time. They're not finished and then they

1 go on a shelf and then that's all you ever know about
2 your ecosystems. They do evolve over quite some time.

3 We would also like to have a first
4 approximation for the non-forest ecosystems other than
5 wetlands which occur in the area of the undertaking.

6 We would like to have the first
7 preliminary products of successional types and trends
8 based on existing literature and some analysis for --
9 of our existing databases, and we are endeavoring to
10 improve our mapping approaches.

11 Q. Just two questions before we finish,
12 then, Mr. Uhlig. On your third bullet point you
13 indicated you'd also hope to have a first approximation
14 of classes for non-forest ecosystems. For
15 clarification, are you able to give the Board an
16 example of what you're talking about there?

17 A. Yes, I could give a couple of
18 examples.

19 In some parts of Northwestern Ontario
20 where fire regimes are particularly intense and the
21 area has been burned repeatedly and intensive many,
22 many times, many of the upland areas no longer support
23 mature forest trees, and what you have is a bare rock,
24 lichen dominated community with juniper existing in the
25 cracks between the rocks. And that, that is, that is

1 your vegetation community, and they don't extend over
2 huge areas, but they are relevant for some management
3 applications.

4 Similarly you can get on very, very dry
5 sites further east, communities which are dominated
6 simply by lichenes, again on very shallow, very dry
7 sites, there will be a mix of lichenes or mosses with
8 few or no mature forest trees ever existing on the
9 site.

10 Those would be two examples that come to
11 mind.

12 Q. Thank you. And one last question.
13 When you indicate at the bottom that the intent is to
14 improve mapping approaches, am I correct that that does
15 not mean that you now have, when you said in the first
16 bullet point that you have a -- you hope to complete
17 the classification for forested ecosystems in the area
18 of the undertaking; is your hope that by '95/'96 those
19 would be mapped as well?

20 A. No. That would be optimistic in the
21 extreme.

22 I think Dr. Osborn has already indicated
23 the size of such an undertaking. We would hope only to
24 have a toolbox in place that will allow for some
25 approaches to mapping at least being feasible, but

1 certainly not having extensive areas of the province
2 mapped.

3 Q. Thank you.

4 And unless the Board has any further
5 questions from Mr. Uhlig, I would suggest that this
6 would be an appropriate point to take a lunch break.

7 MADAM CHAIR: One question.

8 Are you familiar with some of the
9 evidence of Mr. George Marek who was the witness for
10 Forests For Tomorrow? And Mr. Marek had some proposals
11 and some comments about the use of the FEC system
12 particularly, and I think one of his ideas had to do
13 with knowing something better or keeping track of
14 successional types and trends; and I wondered if that
15 has been taken into account or in any way is part of
16 this intended product, about successional types and
17 trends?

18 MR. UHLIG: I'm not familiar with Mr.
19 Marek's evidence specifically, however, the point that
20 you raise of trying to understand successional trends
21 or sequences better within the forest ecosystem
22 classifications is one of the high priority products,
23 and we would like to have that at the end of -- at
24 least a first understanding of that by '95/'96.

25 MS. BLASTORAH: Q. And, Mr. Uhlig,

1 following up on that, if you could turn to your
2 overhead No. 20 for a moment - just the hard copy would
3 be adequate, I think.

4 When you refer to "successional types" in
5 relation to the ELC program, is that what you were
6 talking about?

7 MR. UHLIG: A. Yes, I am. In this
8 particular case, we tried -- this particular overhead
9 is trying to define what ELC would hope to do at its,
10 at its ultimate application, where all ecosystems are
11 addressed, and all successional understanding is
12 inherent in the system.

13 What we're doing is evolving towards
14 that. These first set of products that I, I outlined
15 earlier won't achieve this, but we're moving in this
16 direction. We're trying to be broader in our ecosystem
17 cover and broader in the temporal coverage within our
18 classification systems in the province.

19 That concludes my remarks.

20 MS. BLASTORAH: This would then be a
21 convenient time for a break, Madam Chair.

22 I can advise that we estimate the
23 remaining direct evidence will take about two and a
24 half hours, so depending on the length of the lunch
25 break, I think, and how late the Board wishes to sit

1 today, I think we should be able finish the direct
2 evidence today.

3 And I understand, subject to correction,
4 that Mr. Lindgren and Ms. Gillespie intend to be in the
5 neighbourhood of thirty to forty minutes each in
6 cross-examination.

7 ---Discussion off the record.

8 MADAM CHAIR: That's fine, Ms. Blastorah.
9 Given that schedule, I think we can keep to our regular
10 lunch hour today. We will be back at 1:30.

11 MS. BLASTORAH: Thank you.

12 ---Luncheon recess taken at 11:58 a.m.

13 ---On resuming at 1:31 p.m.

14 MS. BLASTORAH: Madam Chair, I've taken
15 the liberty over the lunch break of distributing the
16 next package of overheads, I've provided that to the
17 parties and copies to the Board. It's a package of
18 overheads entitled: Scientific Research and Technical
19 Development, and then there are four subheadings: Old
20 Growth, Biodiversity and Landscape Management, Other
21 Wildlife Effects Monitoring and Willife Population
22 Monitoring. And I believe the next exhibit No. would
23 be 2285 and there are 17 pages in that package.

24 ---EXHIBIT NO. 2285: 17-page Overhead entitled:
25 Scientific Research and
Development.

1 MR. FREIDIN: Q. Mr. Kennedy, you are
2 going to kick off this discussion I guess on short,
3 short evidence on topical growth.

4 MR. KENNEDY: A. Madam Chair, just a few
5 moments on the topic of old growth.

6 Old growth has been relatively a new
7 concern. A new value that has come to Ontario and, as
8 such, it has been referenced in the hearing from time
9 to time; and MNR has responded to some of the concerns
10 that can arise with the term and condition that you see
11 in the package that were put before you back in
12 January.

13 The new initiative reflects -- sorry,
14 the term and condition reflects the new initiative as
15 put in place through our sustainable forestry program.
16 MNR has reflected the basics of the new initiative. In
17 our specific commune it's made in terms and conditions,
18 specifically term and condition No. 87A and B and in
19 our representation of the informations contained in the
20 values lists which are shown in appendix 6 of the terms
21 and conditions.

22 The new initiative is to provide for
23 Ontario's forest conditions, and the investigation into
24 the subject of old growth ecosystems and to development
25 and environmentally sound conservation strategy, as

1 well as to put in place definitions of old growth for
2 use in Ontario.

3 We also intend to develop management
4 direction concerning old growth values for use in
5 timber management planning.

6 To that end, the Ministry of Natural
7 Resources has put in place two committees: A policy
8 advisory committee which is a ten-member committee
9 who is chaired by Brennaine Lloyd from Northwatch, who
10 I understand has appeared before the Board before; and
11 a scientific advisory committee, which is also a
12 ten-member committee which is chaired by Dr. David Diel
13 (phoen) from the Ministry of Natural Resources.

14 The Canadian members cover a wide variety
15 of expertise across the individuals that are present on
16 the committee.

17 We have also put in place a three-person
18 secretariat within MNR and an internal secretariat in
19 order to offer logistical administrative support to the
20 two advisory committees. That secretariat is based
21 here in Sudbury in the regional office.

22 In the development of these old growth
23 initiatives there are going to be opportunities for
24 public to comment on the input to the strategies.

25 With these two committees in place, we

1 believe that we can benefit from policy and scientific
2 advise in which we also believe that it's the
3 appropriate way in which to deliver the program so that
4 we can develop an Ontario-based management program for
5 the recognition of the conditions that are found here
6 in Ontario.

7 We also believe that in the course of
8 deliberations of both the science committee and the
9 policy advisory committee that we will have increased
10 knowledge base of information drawn and we will be able
11 to have in place a technical basis for appropriate
12 resource management practices.

13 In looking to the future we expect that
14 the works of the committees will result in
15 identification of old growth values where at least
16 criteria by which to judge old growth stands; and for
17 that reasons, we've included it in our values list and
18 that potential in the Appendix 6.

19 We also expect that the outcome of -- one
20 other outcome of the committee's work will be
21 information committees that assists in -- assisted in
22 setting prescriptions for management of old growth
23 values through the timber management planning process.

24 And that is what there is to say on that
25 subject.

1 MS. BLASTORAH: Madam Chair and Mr.
2 Martel, we're moving on next to the subject of
3 conservation of biological diversity, and Dr. Abraham
4 will be addressing that.

5 DR. ABRAHAM: Madam Chair, Mr. Martel,
6 good afternoon.

7 I'd like to speak briefly about three
8 things: The general topic of addressing wildlife --
9 excuse me, addressing biological diversity in timber
10 management; what the concern has been that's been
11 expressed, and by whom, and briefly discuss the topic
12 of what it is or what we understand it to be; and then
13 we deal with how the Ministry is addressing the concern
14 at the present time.

15 And the latter two parts are updates of
16 the other wildlife effectiveness monitoring program
17 which was proposed in Panel 16 and has since been
18 developed through committee structures and workshops,
19 and... But the monitored program also first proposed
20 in Panel 16, both of the latter two are subject to --
21 are the subjects of specific terms and conditions.

22 To begin with, I would like to summarize
23 the very wide expression of concern about biological
24 diversity and the -- some of the places where that --
25 where the Ministry has heard that concern and whether

1 the Board is aware of that concern being expressed.

2 One is in a strategic direction document
3 for the Ministry of Natural Resources entitled:
4 Directions 90s, where approaches to biological
5 diversity and ecosystem level management have been
6 addressed specifically.

7 Secondly, in the Ministry's wildlife
8 working group - which was planned from 1989 to 1991 and
9 published a report on the strategies, it's former
10 Wildlife Strategy for Ontario - the goal of that
11 working group report was a diversity of healthy
12 ecosystems and associated wildlife for continuous
13 public benefits, and one of the main objectives was the
14 maintenance of biodiversity; and, of course, in the
15 context of the timber management Environmental
16 Assessment, there have been numerous references and
17 discussions of the concept and some of the technical
18 details of biological diversity. And the way we are
19 proceeding with other wildlife monitoring and
20 population habitat monitoring are in a way that would
21 deal with the concept of biological diversity, because
22 the concern for those topics in the original panel and
23 throughout the timber Environmental Assessment hearings
24 has been very closely related to the concerns for
25 biological diversity.

1 In many ways these latter two forums help
2 to focus the concern and provided opportunities for
3 people other than the Ministry of Natural Resources to
4 express their ideas, and particularly with the
5 monitoring workshops, the series of workshops in
6 1990/'91, gave an opportunity for that. And the
7 habitat committees were structured with not only MNR
8 staff, but staff from other locations for other
9 agencies.

10 What we accept as the definition of
11 "biological diversity" is something that's easy to say
12 but reasonably difficult to, to comprehend in total.
13 It's the total variety and variability of living
14 organisms and the ecological systems of which they're a
15 part. Now, that's fairly simple to say.

16 What it is not is some simple, early
17 concepts of diversity that is the number of the --
18 simply the number of things. That's one component of
19 biological diversity, but it's not the whole concept.

20 There are several levels of wildlife
21 biological organization at which biological diversity
22 is thought to be measurable or at least where the
23 concept is meant to apply, and the genetic level and
24 the molecular level where all of the things, the key
25 words that we have in terms of structure, composition

1 and function the genes at that level or the level of
2 genes, all those things occur, and there are structures
3 and there are compositions and there are functions;
4 similarly at the level of the species and at the
5 community and at the higher level of regional
6 landscapes.

7 To give some examples of what "structure"
8 means and "composition" and "function", I provided a
9 couple of examples in the context of timber management
10 or landscape. A physical organization of patterns, our
11 example of some structures; the numbers and types of
12 species or genes are examples of the composition; an
13 processes such as nutrient cycling or carbon cycling
14 would be some examples of the kinds of processes that
15 we're talking about. Some of these are clear, some of
16 them are reasonably well known, many of them are only
17 known on a very superficial level.

18 In total our agreement -- there is
19 agreement in general on what biological diversity is,
20 but it's an agreement that extends to the fact that
21 it's not simple and there's much that we need to learn
22 in order to use it practically in timber management or
23 in management of any systems.

24 - I tried to express what the concern is,
25 and I think I tried to focus on what the general

1 public's concern would be as much as or more so than
2 what the concern of scientists or managers might be or
3 policy decision makers.

4 The public is definitely concerned.
5 We've heard this expressed many times, about the
6 irreversible loss of flora and fauna. Much of the
7 popular information about biological diversity has to
8 do with extinction rates. These are things that we
9 can't recover once lost, and there's understandably
10 concern about that shared by all of us.

11 Another concern is that we're doing
12 something inadvertently, without knowing and that we
13 don't know the consequences of it, so I've expressed
14 this in terms of any great loss of integrity of
15 ecological systems through our own actions, and this
16 specifically includes damages to the composition which
17 is not readily apparent, perhaps, and in particularly
18 to the function or the processes of that level - the
19 things that are not seen, not as easily seen as birds
20 and butterflies and particular plant species. We may
21 not be aware of our effects on those things, and if we
22 don't know, we don't know if we can and if we can
23 recover those things; and if so, how hard or extensive
24 or time consuming recovery might be.

25 And finally, there is a sense that

1 components of ecological systems are not intrinsically
2 valued for -- in their own sake. That is that another
3 way to express that is that we have a moral obligation
4 to prevent extinction of species, to make sure that
5 systems function in the way in which they, they are
6 meant to function, if I can use that expression. And a
7 simple way of expressing the concern here is, must
8 everything have a monetary or a commercial value?

9 If I can move onto how the Ministry of
10 Natural Resources is attempting to address the concern,
11 and there are several ways.

12 First, I'd like to say that the
13 conservation of biological diversity is an objective.
14 It's not a process in itself and it's not a thing in
15 itself, it's our objective for sustainable management.

16 The MNR has recognized a need for a
17 policy framework for conservation of biological
18 diversity and, toward that end, some of the specific
19 projects that I'll be looking at in a minute of forest
20 fragmentation and biodiversity project are meant, meant
21 to address that. And there is also a task force or an
22 MNR working group of senior managers who are dealing
23 with the building consensus on the definition, on the
24 need for it, on the public perceptions and looking
25 - towards a policy framework in which a conservation of

1 biology -- biodiversity can be dealt with.

2 There is a wider concern than just within
3 MNR for this approach, and, again, I take you back to
4 some of those forums in which you have perhaps heard
5 the expression. And the reason that MNR is seeking the
6 development of a government-wide statement, not simply
7 an MNR Ministry policy or statement on biodiversity.
8 This would include other significant ministries that
9 have influences on the landscape and on the components
10 of the landscape and of the ecological systems. For
11 example, the Agriculture and Food Ministry, Municipal
12 Affairs and so on -- is there something I'm doing
13 that's making it snap like that?

14 MS. BLASTORAH: Q. I'm not sure what the
15 problem with the microphone is, Dr. Abraham. I think
16 it is causing the reporter some little grief. If I
17 could just ask you when that happens where it catches
18 you in the middle of a word, I know it's disruptive,
19 but if you could repeat the word, I think it would be
20 useful. Or maybe switch places with Mr. Watt might be
21 easiest.

22 DR. ABRAHAM: A. We'll see if it's my
23 voice.

24 I'm not able to advise of this right now,
25 of the status of development of that government

1 statement other than to advise that there is a -- there
2 have been discussions toward a draft MNR statement
3 which I think would form the basis for discussions with
4 other ministries.

5 In addition, the Ministry has recognized
6 that - and here I'd like to insert a couple of words
7 that I left out - that conservation biological
8 diversity in this overheard, in the third bullet point
9 on overhead No. 7, it should say that the conservation
10 of biological diversity is an outcome of the way in
11 which ecosystems are managed.

12 And leading into some of the initiatives,
13 I'll describe in detail, in more detail. But the MNR
14 has recognized that this will eventually require some
15 kinds of landscape level objectives for a diversity of
16 ecological units.

17 I would like to emphasize here that we
18 have not yet exactly determined what those objectives
19 are. Because of the complexity, we haven't determined
20 how to measure them or indeed how we're going to obtain
21 those objectives, and at this point I would just like
22 to add that -- well, I'm going to further develop some
23 of these ideas and as will Mr. Watt, to list and
24 describe several of the initiatives which will
25 hopefully show our progress towards the development of

1 those information needs and capabilities of setting of
2 objectives.

3 MNR's moving towards landscape level
4 approaches to management. If I can refer you to
5 Exhibit 2275 which was the Wedeles et al report on
6 approaches to have debt management, as an example.
7 Those recommendations are being considered and have
8 been considered. One of the main ways that we're doing
9 that is by investigating landscape ecology tools and
10 methodologies for the purpose of an analysis,
11 classification and evaluation. And that commitment is
12 listed in term and condition 90 of the MNR.

13 Much of this assumes that some of the
14 tools is the use and development of geographical
15 information systems. Some of the development is not
16 totally dependent on having GIS in a management level,
17 but during the development phase it certainly does
18 suggest the use of geographical information systems.

19 Another way that we're moving toward
20 landscape level approaches are the initiation of
21 monitoring programs for wildlife populations which are
22 identified in term and condition 67, and also our
23 habitat monitoring programs.

24 The importance of these two biological
25 diversity are that that there are two ways in which we

1 can measure the status of the species component, the
2 composition component of biological diversity with
3 respect to setting -- determining policy or measuring a
4 policy of no decline of species at the provincial level
5 with respect to the effects of timber management.

6 And the final point in this overheard
7 expresses the need for research to test. The major
8 assumption made when we accept the proposition that we
9 need to manage for a diversity of land classes, and
10 that is that managing for representative diversity or a
11 pattern of land classes that that will conserve flora
12 and fauna. And I stress that that's an hypothesis that
13 needs or is an assumption at the very most which needs
14 testing through further research and collection of
15 information.

16 The advantage of doing that kind of
17 management is that it allows us to be holistic in an
18 approach, specifically we can deal with many species at
19 the same time without having to deal with them each at
20 the individual level. But in order to assure ourselves
21 and others that that's an appropriate approach, we need
22 to do the monitoring and the research to confirm that
23 it's achieving the objectives that it was meant to.

24 I'd like to move on now to current
25 initiatives that will provide some of the key

1 information and tools, specifically some that are not
2 currently available.

3 There are five points here to consider,
4 and they include the population. The last two are the
5 population monitoring and other wildlife effectiveness
6 monitoring programs.

7 The first one, which I'll spend very
8 little time on, is ecological land classification. As
9 you heard before the lunch break, Mr. Uhlig described
10 it as underpinning several other things in the Ministry
11 or in management and how it provided an effectual
12 building block for multi-user demands.

13 It provides us with common definitions,
14 equally suitable for describing habitat and landscape
15 for timber management purposes or for wildlife
16 management in timber management purposes.

17 It allows us specifically to measure one
18 of the major components of biological diversity and
19 that is the spatial component or the spatial
20 distribution and abundance of vegetation communities
21 which are keys in the relationship of other components
22 of the ecological systems.

23 I'd like to stress two points about the
24 landscape -- the land classification system. First, is
25 that it will define land units in various scales, not

1 simply one scale as was demonstrated by Mr. Uhlig; and
2 that it will allow us to set objectives for inventory
3 for monitoring and management which allows us to deal
4 with the time scale in dynamic ecological systems.

5 Q. Just before you move on, Dr. Abraham,
6 I have one or two questions for you on that point.

7 Mr. Uhlig this morning described those
8 various scales and used the illustrations behind you to
9 give the Board some idea of the various scales he was
10 talking about. One of the scales that he described as
11 not yet mapped, it was the ecosection scale. And he
12 indicated that there would probably be over a hundred
13 or several hundred ecosections in a forest management
14 unit.

15 Would the ecosection scale be a
16 reasonable scale at which to set biodiversity
17 objectives?

18 A. Okay. That's an interesting
19 question.

20 The setting of objectives, one of the
21 major problems or major concerns we'll have to deal
22 with is at what level is appropriate to set up
23 objectives for biological diversity.

24 I'm familiar with some of the evidence
25 provided to the Board and some of the terms and

1 conditions from the other parties, and this question is
2 dealt with there to some extent.

3 If I could first refer to the image at
4 the back which is labeled A which shows a large piece
5 of Northwestern Ontario with the landsat image, and
6 also with orange/red acetate shows the size of fires in
7 that system. At that level, a piece of the -- of
8 Ontario, the size of that where you're talking, many
9 dozens of hundred miles --

10 MR. UHLIG: A. More than a hundred
11 kilometres on its side.

12 DR. ABRAHAM: A. More than a hundred
13 kilometres on its side. That would be an appropriate
14 level at which to examine the landscape level
15 objectives for biological diversity. There would be
16 many that is equivalent to an ecological region or
17 larger and there are enough patterns repeated and
18 systems in there in order to allow us to deal with
19 objectives.

20 At a smaller scale -- sorry, in smaller
21 dimensions such as is represented on photograph B
22 which, I think, represents an area -- it's a blow up
23 representing an area of about under five miles on its
24 side. I think it's, I'm not sure exactly, but I'm sure
25 its under five.

1 And Mr. Uhlig, I think, referred to there
2 being several ecosections or ecological sections in
3 that area, so we may be talking about an ecological
4 section being a mile by a mile or a mile by two miles,
5 and at that level I think it's totally inappropriate
6 to deal with biological diversity objectives. That's
7 not to say that species -- that there wouldn't be whole
8 populations of a particular species of small mammal or
9 insect, butterfly, within a mile by a mile, but to set
10 objectives at that level would be a very onerous task,
11 to say the least. And, in a way, similar to Mr.
12 Uhlig's expression that we wouldn't try to measure the
13 composition at the ecoelements scale, I don't think
14 we'll try to measure biodiversity at the scale -- at
15 the dimension of a mile by a mile.

16 We would want to be assured that the
17 kinds of components, the kinds of the compositions
18 representative of those scales is sufficiently repeated
19 across the whole landscape, but not necessarily try to
20 maintain something esthetical in a stable continuous
21 supply at that level.

22 Is that...?

23 Q. Yes. One follow-up question on that,
24 Dr. Abraham. If your objective were to monitor
25 wildlife populations in terms of ensuring that that

1 aspect of the wildlife faunal aspect of biological
2 diversity were being maintained, would it be
3 appropriate or not to do that monitoring at that same
4 scale at the ecosection scale?

5 A. No. My answer would be very similar
6 to what I've just said for setting biological diversity
7 objectives, that it would not be appropriate to monitor
8 populations at that scale.

9 We have -- you will hear information in
10 the later overheads, in point 5, 4 or 5, about the
11 level at which we are going to -- at which we are
12 attempting to monitor populations, the provincial
13 level, the regional level certainly, and perhaps forest
14 management unit level, but that would, that would
15 contain many, many ecosections.

16 Q. Thank you.

17 A. Excuse me, I'll bring you back to
18 Overhead No. 9 of that package.

19 Point No. 2 which I've titled: Effects
20 and Effectiveness Monitoring of Moose Guidelines, and
21 since I spent a considerable amount of time describing
22 the progress of that project to you over the past two
23 days, I simply want to indicate here that that program
24 will develop in test ecological or landscape ecology
25 technology and tools for comparative analysis to

1 landscape characteristics or level, landscaped level
2 implications for all wildlife, not simply moose - a
3 point I made earlier.

4 I also wanted to indicate how interactive
5 this component of the effectiveness monitoring program
6 has been. We have a research and development
7 partnerships with science and technology and it's --
8 with Canadian Wildlife Service, with Forestry Canada
9 and with some of the industry representatives: Boise
10 Cascade and Canadian Pacific Forest Products, all of
11 which are contributing to this interactive development
12 and testing of these landscape ecology tools.

13 Some of the things that this program and
14 the next, point 3, of the forest fragmentation
15 biodiversity are measuring are things such as forest
16 patch size, forest patch distribution. Taken together,
17 size and distribution are an expression and can be
18 expressed by a spatial diversity in one sense.

19 We're also developing tools to measure
20 adjacency. For example, the proximity of late winter
21 moose cover with late winter food classes, as an
22 example. The connectiveness on the landscape, so
23 opportunities for species to move within forest canopy
24 from one patch to a similar patch.

25 And also such things as edge to area

1 ratios which are expressions of - one expression of -
2 fragmentation of the degree of fragmentation. Another
3 expression of that would be, or another use for that
4 would be as an expression of available habitat for an
5 edge living species.

6 All of these characteristics that are
7 indicated are helpful in measuring natural and human
8 influence, patterns created at the landscape at various
9 landscape levels.

10 I'd like to make sure I leave you with
11 the message that there's a lot of research and
12 development needed here, but not -- it doesn't mean
13 that we don't have a good idea of where we'd like to
14 start and where we'd like to go with these things.
15 It's just that they take time to develop and that some
16 progress is being made on them.

17 And perhaps I could provide one final
18 example of how all these different characteristics vary
19 with scale, and using a particular one, in this case
20 let's say "interspersion", by which I mean the -- I
21 guess I earlier referred to that as adjacency, so let
22 me go back to adjacency.

23 We might want to know how frequently --
24 well, we might want to measure the characteristic of
25 how frequently there is browse in proximity to the late

1 winter moose cover. The dimensions at which we ask
2 that question in a spatial analysis of the land surface
3 would effect the answer that we'll get. So if we have
4 spatial dimensions of one mile by one mile, we might
5 miss one of the, one of the two components.

6 We might have an area of winter cover, a
7 good area of winter cover which might be immediately
8 adjacent to a good area of winter browse, but, at that
9 small dimension, had only a single occurrence of that
10 or a long linear occurrence of that at that scale and
11 we would get an expression, a numerical expression, of
12 a relatively low, a low index of that characteristic.

13 If we expand the dimensions to be several
14 miles or several kilometres the size of an individual
15 animal's home range like a moose, in this, in this
16 case, you would have many, many examples of the
17 adjacency of the winter cover with winter browse and
18 you would get an expression of much more -- of a much
19 higher index.

20 It only makes sense if you compare one of
21 those units to another unit or a managed area to a
22 natural area.

23 Another example, speaking of natural
24 areas, would be the scale at which you would want to
25 look at, well, the influence of fires on pattern in

1 landscape, and here I can take you back to the landsat
2 image A. That's an appropriate scale. It represents
3 an ecological region or something larger, maybe several
4 ecological regions, and at that scale it would be
5 appropriate to look at the influence of fires as a
6 disturbance factor on the land surface.

7 But at the smaller dimension of the
8 ecological section, as in photograph B, we may
9 completely miss a fire for many, many years, and
10 therefore it's not an appropriate spatial dimension to
11 deal with that disturbance factor.

12 And I can move on to overhead No. 10 and
13 describe for you the forest fragmentation and
14 biodiversity program which is part of this Ministry's
15 sustainable forestry initiative. And the vehicle -
16 would you flip back? - this should be point 3.
17 ---Overhead changed on screen.

18 DR. ABRAHAM: The long-term objectives of
19 this program are to develop an ecological framework for
20 managing natural resources on this sustainable basis.

21 Now, what does that mean and why is that
22 expressed as the long-term objective? It was in the
23 context of the interesting and something... contentious
24 issue of old growth, it was recognized that there might
25 be a lack of or need for more ecology in policy

1 development. Mr. Kennedy spoke briefly to that
2 earlier.

3 This program of information collection
4 and research is specifically aimed at filling that gap
5 and information about ecology in both policy
6 development and in short-term strategic direction for
7 old growth.

8 So in this case the vehicle for interest
9 is -- of interest is the old growth concern, and the
10 previous example, the vehicle of interest was the use
11 of moose habitat guidelines.

12 In many ways they're very similar in
13 terms of the development of some of the tools and
14 technologies and, in fact, they are -- there's
15 communication between the scientists involved in both
16 projects, and in that sense I would call it
17 interactive. Because of the difference in the
18 vehicles, however, we may learn things in the old
19 growth vehicle that we would not have perceived in the
20 moose guidelines vehicle and vice versa.

21 The short-term objectives of the forest
22 fragmentation and biodiversity program are specifically
23 to gather information for an interim conservation
24 strategy for red and white pine old growth forests.
25 The information is being collected at both the stand

1 level and the landscape level.

2 Part of it will be used to define old
3 growth in terms of vegetation ecology criteria, and
4 toward that end, I would like to describe very briefly
5 the four major program components which are vegetation
6 ecology, faunal ecology, sociology and landscape
7 ecology, all of the old growth red and white pine
8 forests.

9 I'm only going to deal with vegetation,
10 faunal and landscape ecology in any extent. The
11 sociology of that component has been described in the
12 witness statement and I believe the visual resources
13 estimate is related to that, and you may hear something
14 more about that.

15 In terms of vegetation ecology, the aims
16 of that component are to examine the composition of the
17 vegetation community, species composition, the
18 characteristics of the flora in different of the -- in
19 old growth stands of varying age or development of
20 sequence, the knowledge gaps about the vegetation
21 ecology of old growth red and white pine forests.

22 Similarly with faunal ecology, the focus
23 today has been on the bird fauna, although there is
24 recently a report which summarized information from
25 experts in old growth fields asking and asked for

1 direction in the faunal area, and I believe
2 invertebrates were considered to be a key faunal
3 component that should be pursued in the form of an
4 ecology study of old growth red and white pine forests.

5 Both of the those components, the
6 vegetaton and faunal ecology, will deal with structure,
7 development, variability and composition, all of which
8 are key components of biological diversity.

9 The landscaped ecology component of the
10 old growth red and white pine forests of the forest
11 fragmentation program is to provide a digital
12 information base on those forest types in the eastern
13 portion of their range, and it is intended, I think, to
14 extend that to the western portion of the Ontario
15 range.

16 Just to summarize a key point here, this
17 program is meant to be comprehensive both in terms of
18 being multi-disciplinary and also comprehensive at
19 several spatial scales.

20 Now moving to the next overhead, point 4.
21 Point 4 and point 5, I have explained how they are
22 related to the biological diversity concerned, but in a
23 way they're updates of information that the Board has
24 earlier heard. And I'd like to bring you up-to-date on
25 where the other wildlife effectiveness monitoring

1 program is and where the population monitoring program
2 is.

3 Panel 16, there was concern expressed for
4 the appropriateness and the adequacy of habitat
5 management and the way the government was currently
6 conducting it in timber management, for the species
7 other than the featured species. Toward that end, the
8 Ministry had facilitated workshops wherein a group of
9 experts and -- well, experts and facilitators got
10 together to explore what the information needs were,
11 what information was available to try to design a
12 framework research program or information gathering
13 program to show the gaps, and a report entitled:
14 Investigation into Effects of Timber Management on
15 Wildlife which has been filed as Exhibit 2274 this
16 morning and which is also the subject of term and
17 condition 66 was produced.

18 The participants at those workshops
19 represented a variety of non-government agencies,
20 government staff at the field practicing stage, the
21 research stage in the policy development stage, other
22 government ministries at the federal level and the
23 university scientists as well. Those participants
24 emphasized landscape approaches to management and to
25 monitoring rather than the species-by-species approach

1 which you heard detailed in Panel 16 and which was
2 initially intended to be the way we would proceed.

3 That emphasis led to a number of
4 recommendations which I've summarized in the next
5 overhead, but before I go there I'd like to reiterate
6 that the -- or to emphasize that the participant in
7 addition to saying that that was the approach
8 necessary, that we're sure or we're clear to say that
9 had we then approached to management and monitoring, we
10 would still need to do more than just monitor the
11 maintenance of habitats or ecosystems; we'd have to
12 test with the assumption that I said earlier, that that
13 meant that other components of the ecological systems
14 were healthy and were thriving, and we intend to do
15 that with our commitment in term and condition 67.

16 The recommendations from the workshop can
17 be summarized in four points.

18 The first is the overwhelming expression
19 of a need for ecological land classification and all
20 that it entails, to describe the land basis, to help us
21 inventory, to develop models of how the land surface
22 progresses through stages of succession.

23 The second point was that to make that
24 information useful we would have to develop
25 reliable, incredible wildlife land classification

1 associations or wildlife habitat associations at
2 various spatial scales appropriate to the species of
3 wildlife that we are dealing with.

4 We'd also need to undertake experimental
5 intervention once we had ecological land classification
6 and some associations that we were satisfied with. We
7 would have to undertake experimental interventions with
8 management, and also to do a trial management plan to
9 test those associations to see if we were able to
10 manage, using those tools and that information. And
11 here we're talking about a management plan, the trial
12 management plan is one in which we're willing to take
13 some degree, some higher degree of risk to explore the
14 relationships that we've discovered and propose to use.

15 And finally, a couple of items in the
16 recommendations from the workshops were to evaluate
17 specific guidelines. An example would be the
18 guidelines for the protection of bald eagles or
19 red-shouldered hawk habitat or specific habitat
20 features, such as the impact of load corridors habitat.

21 That program and the next have been, have
22 recently been approved at the Ministry level and some
23 of the interim steps that we have taken during the
24 development and until the approval was gained are --
25 include the support of a variety of activities. And

1 here, again, I summarize them.

2 The first one is to support the program
3 of ecological land classification and the expansion of
4 that program to stages that are particularly important
5 to wildlife which have been left till later stages of
6 development of forest ecosystem classification,
7 specifically early successional stages of wetlands in
8 riparian areas.

9 We're doing that -- all of these interim
10 steps, by the way, were done I think in the spirit of
11 cooperative and cross-disciplinary development of these
12 tools, which is appropriate to the level of concern for
13 biological diversity.

14 The second point is that we're looking at
15 preliminary expressions of management objectives, and
16 one of the criticisms has been: How long do we have to
17 wait for the land classification system? Do we have to
18 wait till the end before we can get on with some of
19 this?

20 And clearly the answer is "no" to that.
21 It's just a difference in the terms in which you
22 describe habitat, and Mr. Watt will go into this later
23 in his evidence.

24 This preliminary expression is being used
25 in research models, it's been used at a preliminary

1 stage in some wildlife management plans in Ontario, and
2 also some district management exercises.

3 The third point, the development of
4 wildlife habitat associations. The program has
5 supported a variety of efforts to gather more
6 information and develop preliminary associations
7 between four songbirds of habitat types expressed as
8 forest ecosystem classes in mature forests. Similarly
9 with small mammals supporting the study, cavity-nesting
10 birds and their use of habitat.

11 And the fourth point is a preliminary
12 violation of red-shouldered hawk guidelines has been
13 undertaken.

14 Moving to the next overhead and to
15 describe the population monitoring program which, in
16 which the -- for which the Ministry's commitment is
17 expressed in term and condition 67. It arose from
18 Panel 16 again with that same concern for wildlife
19 other than featured species.

20 In this case a committee representing a
21 large number of Ministry staff but including
22 representatives from the Canadian Wildlife Service,
23 Royal Ontario Museum, Federation of Ontarian
24 Naturalists, and Ontario Federation of Anglers and
25 Hunters, among others, was formed.

1 That committee met many times and
2 developed a population monitoring plan which has again
3 recently received approval, and the recommendations,
4 the key recommendations from that plan are that
5 population monitoring for the purposes of population
6 trend -- sorry, population trend monitoring for the
7 purposes of measuring how well populations are doing
8 and against the objective of no decline in provincial
9 populations, there is a recommendation for ecologically
10 valid population trend information, so trend
11 information appropriate to the scale over which the
12 species ranged.

13 In this case there was a recognition at
14 least at the ecological region level and in some cases
15 at the forest management unit or wildlife management
16 unit level, that trend information would be necessary.

17 I guess that's -- the next point is well
18 summarized.

19 Moving to the third point, the kinds of
20 species that would have to be monitored or for which
21 there would be monitoring emphasis may not be the same
22 across all areas of the undertaking. It may well
23 differ by region.

24 And finally we would link the population
25 monitoring program and habitat monitoring program

1 because of the close link that we see in direct and
2 indirect means of measuring the distribution of species
3 through predictive association models.

4 You can see a degree of convergence here
5 between the two programs, and that's a true
6 convergence, I believe.

7 The next overhead explains some of the
8 first steps. The first step, now that an approval has
9 been obtained to implement the program, is that there
10 is a proposal at least for a pilot monitoring unit to
11 concentrate expertise, and focus and development of
12 monitoring protocols from many different wildlife
13 groups.

14 The exact mechanism by which that unit
15 might be implemented is not -- is still the subject of
16 discussion, but that is the outline at least.

17 We have had some ongoing monitoring
18 projects supported by this program over the last two
19 years in the area of small mammal population
20 monitoring. Particularly we've emphasized here
21 initiatives that have -- in which the Ministry has a
22 past investment or for which it was demonstrated there
23 was a long-term database which needed support and which
24 would help to serve the purposes that the Ministry has
25 set out in it's publication of the interim program. So

1 red-shouldered hawk monitoring, forest birds
2 monitoring, bird migration monitoring and amphibian
3 monitoring are all examples of ongoing monitoring
4 projects that this program has supported.

5 And as I mentioned in the old growth
6 forest fragmentation program, we are also looking at
7 the development of monitoring methods for
8 invertebrates.

9 The implementation of all of the things
10 I've mentioned here, points 1 to 5 in these current
11 initiatives has the Ministry approval. Some of them
12 are at more advanced stages of development because they
13 were initiated earlier. Specifically here, 4 and 5 are
14 only recently approved although there have been these
15 interim and ongoing projects. And we're at the point
16 of discussing the best mode of interim implementation
17 now.

18 It's also worth pointing out that all
19 five programs require considerable, considerable
20 resources both in human resource terms and in financial
21 resource terms to continue into satisfactory programs.

22 One specific Board issue was how
23 biological diversity at this larger spatial dimension
24 and featured species habitat management, how compatible
25 they were. It's our position that they are compatible;

1 that specifically managing for featured species such as
2 rare, threatened and endangered species, big game such
3 -- as moose and deer and other species of social
4 significance that might be locally featured that that
5 is not mentioned exclusive with biological diversity
6 management or setting objectives for conservation of
7 biological diversity.

8 I can express that in other, in some more
9 specific ways. While it's appropriate because we still
10 need to -- while it's appropriate to have featured
11 species habitat management because we still need to
12 ensure, for social reasons, the maintenance or recovery
13 of populations of wildlife in certain places and at
14 certain times, this can occur within the broad
15 boundaries established by objectives for biological
16 diversity.

17 That does, however, require us to measure
18 two things: How featured species habitat management
19 affects the attainment of those biological
20 diversity-related objectives and vice versa; how do the
21 boundaries of biological diversity objectives limit or
22 change the flexibility of managing for socially
23 significant species?

24 And a point that needs to be made is that
25 if conservation of biological diversity and the setting

1 or obtaining of objectives for featured species habitat
2 management were to conflict, then biological diversity
3 would take precedence.

4 There are some problems of dimension that
5 arise in decision making and I'm sure that the Board
6 doesn't have to be reminded how complex some of the
7 decisions might be in assessing significance. One
8 thing, it's something at one scale; it might be not
9 significant at another. And vice versa.

10 We don't know at this time or we don't
11 have evidence that featured species habitat management,
12 our past habitat management has significantly altered
13 biological diversity in Ontario, but many of the
14 initiatives that I have outlined for you are
15 specifically oriented towards trying to get the
16 information to assess that.

17 Just to summarize, then, we're moving
18 towards management for biological diversity through the
19 setting of landscape level objectives or the
20 development of techniques and tools to do that and to
21 ensure that there is a representation of all ecosystems
22 in the future.

23 In answer to an interrogatory, and I'd
24 like to repeat here, we'll not be able to tell
25 specifically -- will not be able to define at a

1 specific point in time when we can say that we're
2 managing for biology diversity, and we view it as a
3 long, gradual evolution. And as I pointed out, until
4 we have the information to assess whether what we're
5 doing now is not managing for biological diversity, we
6 don't have a definitive answer.

7 We're making progress in terms of the
8 development and implementation, but that depends on how
9 fast we proceed; it depends on the levels of funding;
10 the technology and new developments in science,
11 elsewhere as well as in Ontario; and the training of
12 staff to accomplish those objectives. It's not a money
13 matter alone, it takes time to do it and to do it well.

14 We're going to, as we develop the
15 techniques -- and as we'll hear from Mr. Watt in a
16 moment, they will be, the techniques will be developed
17 and incorporated in timber management process as they
18 become tested, and progress on that will be reported
19 for the term and condition 93 on reporting.

20 The effects of timber management on a
21 wide range of wildlife species will be investigated
22 through the program of effectiveness monitoring and
23 population trends of other wildlife will be monitored
24 to detect, to detect changes and to signal whether
25 changes in management practices are necessary.

1 I thank the Board, and I'll answer
2 questions if you have some.

3 MS. BLASTORAH: Q. Just one point of
4 clarification, Dr. Abraham. You mentioned an
5 interrogatory answer in that last summary and you
6 didn't mention the number. Do you have the number
7 convenient?

8 DR. ABRAHAM: A. Can I get back to you
9 in a minute?

10 Q. Yes.

11 We'll provide that number after the
12 break, Madam Chair. And, actually, while I'm clearing
13 up administrative matters perhaps I could just advise
14 the Board of two other exhibit numbers.

15 This morning I indicated that the Code of
16 Practice had previously been marked and we were marking
17 the new illustrative version, I can advise the Board
18 that the Code of Practice was previously marked as
19 Exhibit 434 early on in the hearing. That's the
20 practice for timber management activities in riparian
21 areas, and I think that was the only other
22 administrative matter that we had. Thank you.

23 Would it be convenient to take a break at
24 this point before we begin Mr. Watt's evidence?

25 MADAM CHAIR: Yes, it would Ms.

1 Blastorah. We will take a twenty minute break.

2 ---Recess at 2:30 p.m.

3 ---On resuming at 2:59 p.m.

4 MR. FREIDIN: Madam Chair, we are now
5 going to proceed to deal with the subject matter of
6 habitat supply analysis and modelling.

7 Mr. Watt is the witness in relation to
8 that subject matter, and I would like to commence by
9 filing as Exhibit 2286 the series of overheads that Mr.
10 Watt will use during his evidence.

11 ---EXHIBIT NO. 2286: Overhead entitled: Scientific
12 Research and Technical
Development.

13 MR. WATT: Shall I just start?

14 I'd like to start with the first overhead
15 and present a little bit of background which I hope
16 might clear up some of the, what might be some
17 confusion with respect to, again, this A, B, C alphabet
18 soup of acronyms.

19 By presenting to you my understanding of
20 what habitat supply modelling and habitat supply
21 analysis is, and in my view of the words, "habitat
22 supply modelling" is synonymous with "habitat supply
23 analysis" so I'm, from now -- from hence forth I'll
24 just refer to habitat supply modelling.

25 It involves the explicit consideration of

1 future habitat availability under different management
2 scenarios. It's very important if we're really talking
3 about forecasting the future. It differs from habitat
4 suitability indices or HSI, which has appeared numerous
5 times in the evidence, and habitat evaluation
6 procedures or HEP, in that both of those latter two
7 methodologies really only assess habitat availability
8 at a single point in time.

9 If we turn our attention to the overhead,
10 we'll see that what habitat supply modelling involves
11 is taking an inventory of current conditions and
12 combining it with some rules about how those conditions
13 change over time with respect to natural succession,
14 treatment response and the management actions that are
15 applied to the system and are put into an inventory
16 projection model which simply is a bookkeeping system
17 which keeps track of what you're doing to individual
18 portions of that inventory or stands.

19 This then allows us to project a future
20 inventory so at the top we start with time equals zero
21 and we have our inventory today. At the bottom part of
22 the loop here (indicating) we have a projected
23 inventory of some time in the future, which we then
24 assess or evaluate for things like timber yield, in
25 terms of wood supply; wildlife habitat interpretations.

1 And it is only in here at the wildlife habitat
2 interpretations level that habitat suitability index
3 models or HSI models are applicable and again the same
4 thing with the habitat evaluation procedures that have
5 been developed in the U.S.

6 So we routinely use habitat suitability
7 indices but only for these point in time estimates. We
8 still require this overall system to forecast the
9 future development of the forest, and that is what I
10 mean by habitat supply.

11 I think if the Board would look to draw a
12 connection back to Dr. Abraham's evidence which is --
13 well, there's 2285, his overheads 12 and 13 have many
14 of these components listed in slightly different words
15 and so you should be able draw some real similarities
16 between what he presented and this particular slant of
17 the presentation. And that's just by way of trying to
18 let you know that these really aren't a lot of
19 disparate initiatives that are going on. There is some
20 connection between all of them.

21 If I can have the next overhead, please.
22 ---Overhead changed on the screen.

23 MR. WATT: The Board has also heard in
24 evidence that there are at least two kinds of habitat
25 supply modelling - spatial and nonspatial. The

1 Ministry sponsored the preparation of a feasibility
2 report on habitat supply modelling by the ESSA
3 consulting firm.

4 I'd just like to point out a couple of
5 the pros and cons of spatial versus nonspatial
6 modelling. I think it's important to point out that as
7 soon as you're talking about spatial modelling, you are
8 explicitly talking about requirements for a geographic
9 information system requirement which involves large
10 expenditures. However, any outputs from the model are
11 directly implementable in the field because you know
12 where the treatments are on the ground. So it
13 identifies individual stands and we said in this
14 modelling environment that we're going to treat stand
15 "X", which happens to be in Glackmeyer Township, with
16 the following set of treatments.

17 Well, now we can actually identify that
18 on the ground with a spatial model, whereas with a
19 nonspatial model we lose that ability.

20 The spatial models also provide us with
21 the ability to look at spatial analysis within the
22 model, things like adjacency. Is there moose cover
23 next to the moose browse? This is not available to us
24 in a nonspatial model. And a con here is that it does
25 require a spatially explicit inventory which we do not

1 have across the province.

2 In terms of nonspatial modelling, we only
3 require tabular inventory data which is readily
4 available to us, and we don't require expenditures for
5 GIS. But once we've done the analysis, we have to go
6 through at least one more process in terms of taking
7 that plan and implementing it in the field. We have to
8 go through something like a blocking exercise, similar
9 to what I think the Board was exposed to by Mr. Patch
10 when he was presenting evidence.

11 The ESSA report made recommendations that
12 we should proceed with nonspatial modelling in the
13 short term, perhaps two to five years; and in the
14 longer term, work towards the development of spatial
15 models. And this question of how quickly we should
16 implement either spatial or nonspatial models has
17 cropped up a number of times.

18 I think it's important to note that some
19 species can be reasonably well modelled in nonspatial
20 environments, but other species like moose perhaps
21 requires a spatial model to be able to look at the
22 adjacency restraints. We need to be able to develop
23 both to satisfy the needs of our managers who have GIS
24 and those who won't have GIS for the foreseeable
25 future.

1 However, the controlling or limiting
2 factor to widespread implementation of either spatial
3 or nonspatial is the lack of quantitative biological
4 relationships between habitat and populations and our
5 inventory, and this is what will limit the speed of
6 implementation of habitat supply modelling in Ontario.
7 And I'll try to go into these in a little more detail
8 as we proceed.

9 If I could have the next overhead,
10 please.

11 ---Overhead changed on screen.

12 MR. WATT: Overhead 3 lists five
13 categories of barriers to implementation, and I'll
14 quickly run through a few of them.

15 The first one being inventory. Right now
16 our spatial inventory as discussed earlier by Dr.
17 Osborn is not available in a spatially explicit format
18 across the province.

19 The FRI itself only partly addresses the
20 information requirements for the wildlife modelling, it
21 does not address understory (sic).

22 There are FRI enhancements that are
23 planned and underway and there are a number of
24 initiatives in terms of FEC development and mapping
25 that you have already heard about that will contribute

1 to better inventory, however those are some time in the
2 future.

3 Secondly, our understanding of stand
4 dynamics or growth and yield is really quite
5 qualitative and we need to be able to make that
6 information quantitative. We have to be able to
7 address succession in response to disturbance regimes
8 which are both natural and manmade and we have to be
9 able to address all of the vegetation components, not
10 just simply the merchantable trees when we're dealing
11 with growth and yield.

12 I believe in Panel 5 Mr. Greenwood will
13 be addressing growth in a provincial growth and yield
14 program that will address at least some of these
15 concerns.

16 Thirdly, our current inventory projection
17 models which were that big centre block, the
18 bookkeeping mechanism, have been developed for boreal
19 conifer conditions in New Brunswick and elsewhere. We
20 have not yet developed a simulator or a projection
21 model which accounts for uneven-aged management systems
22 or in areas where we have mixed strategies with some
23 clear-cut system and some uneven-aged management. We
24 can track only the even-aged management parts of those
25 kinds of strategies at this point in time.

1 So, therefore, we're unable at this point
2 to adequately predict the future forest conditions for
3 the Great Lakes/St. Lawrence region and in the
4 transitions where we're practicing both even-aged and
5 uneven-aged management. This is difficult for us at
6 this time. We have to proceed with developing a
7 sumulator that will account for those conditions.

8 Fourthly, those same simulators or
9 inventory projection models are being built outside of
10 Ontario for database structures and management systems
11 which differ from ours.

12 When we imported the Forman model from
13 New Brunswick into northern Ontario, we spent
14 approximately a year restructuring the model to make it
15 something what we called "Norman" to account for the
16 differences between the structure of our forest
17 resource inventory information and the structure of the
18 resource inventory information from New Brunswick. And
19 also we had to expand its capabilities to take account
20 of more than just "plant or don't plant", as was the
21 case in New Brunswick to include basic extensive,
22 intensive and natural regeneration methods.

23 This required a fair deal of programming
24 on the part of some of our specialists and we're still
25 finding some bugs with it. So, I mean, therefore is --

1 I would like to get across the point here that you just
2 can't import these things "holes boles" (phoen) we
3 really do have to calibrate the mechanics part of these
4 models. We have to calibrate those to the Ontario
5 situation.

6 Most of the results of these models that
7 we're talking about come in tabular form, long lists of
8 numbers which are difficult to interpret. We need to
9 put in place some structures on those models that would
10 allow for graphical outputs, easier data entry, easier
11 manipulation of management strategies within the model.

12 Right now when our people are running
13 these models, they're spending an awful lot of time
14 dealing with the details of how to get the information
15 in and how to read the tabular output that comes out.
16 We need ways to make that faster and more
17 understandable.

18 And finally, we need to fully document
19 these models. Right now Norman and Forman and HSG are
20 at best partially documented, and such that we tried to
21 take them outside of our region and bring them to
22 another region and a bug came up.

23 Our people wouldn't have an idea of
24 really how to fix it. They would have to bring it back
25 to us and we would have to get our specialist to go

1 right back to the coast, so we need to follow through
2 on some of these initiatives, and, again, this all
3 takes time.

4 Lastly, and perhaps, in my opinion, the
5 largest barrier at the moment is lack of defensible or
6 credible habitat relationships. Our current
7 understanding of how wildlife responds to different
8 forest conditions is very qualitative. It's not
9 explicitly linked to the way we describe our forest
10 conditions, so it's not explicitly linked to FRI
11 descriptors or FEC descriptors. And a lot of that
12 information that we have, that qualitative information,
13 is based on studies that have been done outside of
14 Ontario and in many cases outside of the boreal forest,
15 so we are at this point inputting generalities.

16 Could I have the next overhead, please?
17 ---Overhead changed on screen.

18 MR. WATT: So in my opinion, it's
19 extremely important to thoroughly test and calibrate
20 any models that we import into Ontario prior to
21 widespread implementation.

22 If we intend to use habitat supply
23 modelling to help resolve conflicts in timber
24 management planning or resource allocation, it's vital
25 that all the parties involved have confidence in the

1 underlying science and principles that those models are
2 built on and those relationships are built on.

3 It's been suggested that we should simply
4 use models from other jurisdictions and learn as we go.
5 I disagree with that point of view.

6 Firstly, we know that habitat use varies
7 geographically within a species. I have three examples
8 I'd like to relate to you.

9 In the Pacific Northwest, Washington,
10 British Columbia, the pileated woodpecker predictably
11 uses large, greater than 50 centimetre dead conifers
12 for nesting sites. However, in Eastern North America
13 we find that this same species uses predominantly wide
14 deciduous trees. Again, large, but only requires up to
15 30 centimetres PBH.

16 If we had taken that Pacific Northwest
17 model and directly inputted it into Ontario, we would
18 have had a radically different view of or radically
19 different prediction of what kinds of habitat to
20 maintain the pileated woodpecker than if we, if we had
21 not developed that kind of information locally in
22 Ontario.

23 The same thing can be said for moose. In
24 Newfoundland it uses balsam fir as a staple food source
25 throughout the winter; however, in Ontario, it's use of

1 balsam fir is extremely infrequent. Again, this would
2 lead you to believe, if you were taking the
3 Newfoundland model or knowledge, that in fact in
4 Ontario we should be planning for, in terms of moose,
5 balsam fir communities; however our local information
6 would suggest that that's not necessary.

7 My last example relates to the pine
8 marten, which in many parts of this range or many of
9 the studies that we have done relies on redback moles
10 and the latest species as the predominant food source;
11 however, some information from Antioige (phoen) which
12 was developed by Ian Thompson and I believe is
13 presented to the Board would suggest that in Ontario
14 without snowshoe hare, the pine marten may not be able
15 to survive winters in boreal conditions.

16 So, again, if you were trying to manage
17 pine marten and were simply providing food habitat that
18 had moles in it, you would come to a different
19 conclusion or a different management strategy than if
20 your model was saying: You must have snowshoe hare.

21 So any models that we bring in, we have
22 to recognize -- from outside, that is, in models we
23 bring in from outside, we have to recognize that what
24 we are importing is generalities. And the generalities
25 themselves are portable, but habitat supply modelling

1 is all about quantitative analysis, and quantitative
2 analysis requires specifics, and the only place we're
3 going to get specifics is within our own ecological
4 regions.

5 We also should look at the underlying
6 basis for the models that we're bringing in. Many of
7 them have been developed based on correlations between
8 annual use and stand conditions. Most of them do not
9 have an underlying process or cause effective
10 relationship, so that when, in fact, you're dealing
11 with this correlative models, they are valid within the
12 range within the area that the data was collected.

13 So if it was collected in New Brunswick
14 marten and it relates marten to red spruce balsam fir
15 communities, their version of jack pine communities,
16 and we put that into Ontario, we'll find that the model
17 does not predict very well for black spruce communities
18 which are infrequent in New Brunswick.

19 Relationships built on underlying cause
20 and effect are -- have greater success in being
21 transferred between different areas, however, they
22 require more time and more effort to build. So it
23 doesn't mean that we shouldn't build or develop
24 correlative models, it just means we have to recognize
25 that when we do that, we're less able to transfer them

1 to other ecoregions or to other parts of the province
2 or to other provinces.

3 We have to look at these kinds of
4 trade-offs when we are developing models and when we're
5 reporting models.

6 So in summary on this overhead, it seems
7 clear to me that we have to perform extensive
8 calibration and testing of the habitat relationships
9 that have been developed in other jurisdictions prior
10 to operationally implementing them in Ontario.

11 Through time and the expense required to
12 calibrate and test models varies with a number of
13 factors, and really they're quite obvious: Spatial
14 resolution for the predictions you're trying to make.
15 You want to try and predict accurately at the level of
16 a province or at the level of a district or a township
17 or a stand and these things -- and the farther down you
18 go towards the stand, the more time you have to spend,
19 and then you need more effort to spend to test the
20 models.

21 There's also the question of what I've
22 called the "precision", which is are we interested in
23 predicting simply the presence or absence of a species
24 or are we interested in relative abundance in terms of
25 the number of animals; or are we really interested in

1 productivity in terms of birth rates and mortality
2 rates? And, again, as we go from presence/absence to
3 productivity, there is a current increase in the amount
4 of effort and time required to develop the models.

5 And just as important is how much we
6 already know about the species; and, lastly, how much
7 risk are we willing to accept? How willing are we to
8 be to be wrong in the forecasts and how much are we
9 willing to be wrong? Because, invariably, we will be
10 wrong to some degree or another. So we have to decide
11 what level of risk is acceptable and that will again
12 influence what we have to do towards model testing and
13 calibrations.

14 I'd like to expand on the whole idea of
15 testing, model testing here in this overhead. What it
16 depicts is the structure of a typical habitat
17 suitability model, that part of evaluating where this
18 is, in fact, the habitat relationships and generally
19 there are four components to that.

20 There are underlying assumptions on the
21 far left hand column, also labelled "level A." There
22 are individual variables on how wildlife responds or is
23 related to an individual variable, that's this level B.
24 The variables are combined into components and wildlife
25 response to components, which is level C; and, finally,

1 level D, which is the final model output.

2 Researchers in the United States with the
3 U.S. Forest Service and the U.S. Fish and Wildlife
4 Service suggests that the best way to proceed in model
5 testing is to go from level A to level D. So in this
6 example there is an underlying assumption that foliage
7 density in this case is related to, somehow, to insect
8 abundance in a predictable fashion.

9 I had to go out and actually test to see
10 if that assumption was valid before proceeding on.

11 Testing assumptions at that level is
12 generally not done locally. There will be -- it's
13 usually done by a research agency, not just through
14 local monitoring.

15 Testing individual variables and
16 individual components follow after the assumptions,
17 and, again, they're generally done by centralized
18 research agencies or special research units. Again,
19 not a matter of local effects.

20 And, finally, when final model testing is
21 done, that is the only level where local effects
22 appears to play a role. And even then, while testing
23 at level D with local effects, it is often difficult to
24 conduct a true test. All we can find out at this level
25 most often is that there is a gross error with the

1 model. We cannot identify at that level what is wrong
2 with the model, simply that it is very wrong.

3 MR. FREIDIN: Q. Can you explain, Mr.
4 Watt, just expand a bit as to why levels A, B and C are
5 normally done by a research agency as opposed to being
6 done through local effects monitoring?

7 MR. WATT: A. If we were to through a
8 local effects monitoring -- well, first of all, let me
9 state that levels A, B and C are generally done before
10 models are implemented operationally. That's the
11 background work that's done prior to implementation of
12 the model. It's the model validation -- testing the
13 model before it's used to determine that the underlying
14 principles assumptions are valid.

15 If we were to do that at the local
16 effects level, we would be doing that everywhere and we
17 simply can't afford to do that. Nobody can afford to
18 do that. So, in fact, what's done is it's generally --
19 it's tested at some kind of ecoregional level or at
20 some level appropriate to the range of the species in
21 question. And it's done in perhaps only one or two
22 locations where you can afford to do it, but do it
23 well, because it sets up the rest of, the rest of the
24 model.

25 It's interesting to note that in the U.S.

1 experience with habitat suitability and base models
2 based on best available information and expert opinion,
3 they have not performed as well as hoped for. And in a
4 substantial number of cases they have been outright
5 failures, which has led some in the U.S. to suggest
6 that untested models are of little or no use in
7 management applications, but simply provide a framework
8 for continued research efforts.

9 So, again, the point is test it first
10 before you actually apply it in a management mode.

11 Q. Before you leave that particular
12 slide, can you just expand on the bottom part of that
13 particular overhead where it's got the horizontal
14 scale, provincial effectiveness monitoring--

15 A. Certainly.

16 Q. --at the bottom?

17 A. What I've tried to suggest here,
18 excuse me for missing it, is that levels A through C in
19 Ontario right now are closely linked to the current
20 MGEM program which, which Dr. Abraham discussed with
21 you over the last several days or the provincial
22 effectiveness monitoring concept that Ontario has
23 developed.

24 Levels B, C and D are things that have
25 been -- in Ontario have been traditionally done as well

1 at the level of technology development units or through
2 the regional specialists. And it is only at level D
3 where we would -- where I see the local effects playing
4 a role.

5 The whole concept of local effects is
6 wrapped up with the idea of adaptive management, where
7 you apply your model, you monitor results and you learn
8 from that monitoring. And I think something that I
9 personally feel has been missing from the discussion,
10 at least what I've read through the transcript, is the
11 idea of passive versus active adaptive management, and
12 I would like to explain that and explain some of the
13 limitations involved with adaptive management.

14 Firstly, to adaptively learn about the
15 dynamics of a system or how a system behaves under
16 management implements requires carefully planned
17 management experiments which often have as an objective
18 to markedly perturb the system so you can measure a
19 response. So to learn about the system you have to
20 generate enough of a change to get a response.

21 However, when we're operationally
22 implementing timber management plans or wildlife
23 management plans most of our socioeconomic objectives
24 fall up in the relatively flat portions of this
25 particular response group. So we tend to play or we

1 tent to manage to have relatively stable conditions up
2 here (indicating), yet to test the system, to actually
3 learn something about the system or the model, we
4 actually have to be testing somewhere on this slope
5 (indicating), one, to determine how steep that slope
6 is; and, two, to determine where that slope starts
7 dropping down. Is it dropping down here or is, in
8 fact, the slope really somewhere over here
9 (indicating)?

10 We have to push the system to learn about
11 it the -- yet most of our management objectives are in
12 fact to do just the opposite of that. By pushing a
13 system we take risks that we would push it down to
14 somewhere where we cannot recover it. It would seem to
15 me, then, that we don't want to do that everywhere. I
16 think we have to take some risks, but I don't think
17 that the public of Ontario - and this is my personal
18 opinion - I don't think they expect or would wish that
19 the government would, would gamble, in a sense, with
20 its future resource availability by pushing systems
21 hard everywhere.

22 I think what's happened so far in the
23 development of habitat relationships and model testing
24 in Ontario follows the kind of mixed strategy I'm
25 suggesting. The example I can think of here is, in

1 fact, the moose effectiveness monitoring program which
2 plans to push hard or hard enough to measure a response
3 in one or two areas of the province and learn from
4 those.

5 Across the rest of the province we would
6 monitor the results of regular management objectives up
7 in this area just to make sure the model wasn't grossly
8 wrong, but only on one or to selected study areas would
9 we push the system hard enough to really learn about
10 the model.

11 So what is active about this process is
12 actively pushing the system, and that's when we learn.
13 We don't learn much about the model from passive
14 adaptive management where, in fact, if you just play up
15 in this area of relative stability. And these are
16 concepts that were development or have been outlined by
17 Carl Walters and Buzz Hollings who were basically the,
18 the two individuals that brought the whole concept of
19 adaptive management from industrial systems design to
20 resource management. They have been working on this a
21 long time.

22 Q. Mr. Watt, is there any connection
23 between learning about the model and learning about
24 cause and effect relationships?

25 A. If the model is based on cause and

1 effective relationship and we were testing models, then
2 you certainly learn about cause and effect.

3 I would submit that any place that we're
4 going to push the system hard enough to measure those
5 kinds of responses, we wouldn't want to just test the
6 correlative model, we'd want to learn about cause and
7 effect as well, so we might have a few additional
8 experimental objectives on those kind of areas.

9 And, again, I believe this is happening
10 with projects like the moose effectiveness monitoring
11 program.

12 Shall I move on?

13 Q. Yes.

14 A. With this overhead I'd just like to
15 point out to the Board that the development of habitat
16 supply modelling that's gone on so far in Ontario has
17 not been done in isolation from other jurisdictions and
18 we haven't been redeveloping the proof of concept.

19 What we have done to date is we have
20 adopted a state of the art forest simulator developed
21 in the Petawawa National Forest Institute called: A
22 Harder Schedule Generator or HSG, short form, which
23 will become an essential part of the plus feed forest
24 management systems, the Board system; and I'm not sure
25 if that's been discussed in evidence yet or not.

1 MS. BLASTORAH: It's mentioned, Madam
2 Chair, in Panel 3 Statement of Evidence and actually a
3 summary in relation to that was included at tab, I
4 believe it was tab 2 or 3 - I'll have to check - of
5 that statement of evidence.

6 MR. WATT: Thank you.

7 We have also been working with the Forman
8 model from New Brunswick, it's a wood supply model and
9 we've made some adjustments, as I mentioned earlier, to
10 make it better fit Ontario.

11 Our habitat relationships work as centred
12 around the concept of habitat suitability index
13 modelling and as used by the U.S. Fish and Wildlife
14 Service and the Province of New Brunswick, private
15 forest industries in Alberta and Saskatchewan, and
16 we've also imported the concepts of habitat matrices as
17 developed by the U.S. Forest Service under their
18 habitat evaluations program.

19 I will discuss a little bit of those as
20 we go along.

21 If I could have the next overhead,
22 please.

23 MS. BLASTORAH: And perhaps we before we
24 go to the next overhead, I can confirm that that
25 material is contained at tab 2 of the Panel 3 statement

1 of evidence. It's an article entitled: The Forest
2 Management Decision Support System Project by Dan
3 Bulger and Harold Hunt.

4 MR. FREIDIN: Madam Chair, I note that
5 it's 3:30. I don't believe that Mr. Watt will be more
6 than another half an hour and Mr. Kennedy certainly
7 won't be lengthy tomorrow, and the cross is not being,
8 I think, estimated to be very long. I'm not sure if
9 Dr. Osborn's on tomorrow.

10 What time are you planning on adjourning
11 tomorrow?

12 MADAM CHAIR: One o'clock, Mr. Freidin.

13 MR. FREIDIN: Whatever your preference
14 is.

15 MADAM CHAIR: All right. We think we
16 will call it a day now, gentlemen.

17 Is that okay with you, Mr. Watt?

18 MR. WATT: Certainly.

19 MADAM CHAIR: Can we pick up on page 10
20 when you begin tomorrow morning?

21 I will see you at 8:30. Thank you very
22 much.

23 ---Whereupon the hearing was adjourned at 3:35 p.m.,
24 to be reconvened on Thursday 25th June, 1992 at
8:30 a.m.

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5 I hereby certify the foregoing to
6 be a true and accurate C.A.T.
7 (computer-assisted) record of the
8 proceedings to the best of my skill
9 and ability.

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Tracey Davis,
Court Reporter.



